Exhibit 1

FINAL
VOLUME 1

SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

COVERING

PROPOSED COORDINATED USE OF THE WATER SUPPLY OF LAKE MENDOCINO AND LAKE SONOMA

RUSSIAN RIVER PROJECT

Prepared by

SONOMA COUNTY WATER AGENCY

2425 Cleveland Avenue
Santa Rosa, CA 95401

JUNE 1984

APPENDIX C

ACTION PLAN FOR WATER CONSERVATION IN THE
SONOMA COUNTY WATER AGENCY SERVICE AREA

Revised 12/15/81
Revised 3/12/82
Revised 5/19/82

ACTION PLAN
FOR
WATER CONSERVATION

IN THE

SONOMA COUNTY WATER AGENCY SERVICE AREA

Prepared By:

The Water Advisory Committee

Chairman: John Olaf Nelson, General Manager
North Marin County Water District

Members: Broydon J. Riha, Director of Public Works
City of Santa Rosa

John Sharer, City Manager
City of Petaluma

Ron Brust, City Engineer
City of Rohnert Park

Richard L. Rowland, Director of Public Works
City of Sonoma

Richard Box, Director of Public Works
City of Cotati

Edward Pressey, General Manager
Forestville County Water District

Jerry J. Olrich, General Manager
Valley of the Moon County Water District

Sonoma County Water Agency:

Robert F. Beach, General Manager

Action Plan
For Water Conservation in the
Sonoma County Water Agency Service Area

Participating Agencies

Cities: Santa Rosa, Petaluma, Sonoma, Rohnert Park and Cotati

Districts: North Marin, Valley of the Moon, and Forestville County Water Districts

Basic Strategy

By working through the effected agencies with said agencies taking the responsibility for developing and implementing water conservation initiatives, high opportunity for success is possible. Program elements address: consumer education, water metering, water pricing, water saving devices (for both new and existing development), irrigation techniques and water conserving landscapes, and implementing ordinances, codes, etc. The Water Advisory Committee (WAC), made up of water contractors, supplied with staff services by SCWA, will develop plan elements and convey recommendations for funding and implementation to the various councils and boards. The program developed will be beneficial both for wise use of the region's water resources and for achieving flow reductions beneficial in optimizing use of the region's sewage treatment facilities.

Implementing Program Elements

1. Consumer Education

Goal: *"To continuously increase consumer awareness about the need for and benefits of water conservation."*

The committee will look into and by May 15, 1982, report on what is available in the way of consumer education materials. Applicable material will be selected, based on suitability, for application in the SCWA service area. A theme will be selected and the need for any additional materials preparation, artwork, etc., identified and costs estimated. Reproduction costs for the first year's program will also be estimated. Funds will be sought for inclusion in the SCWA's F.Y. 82-83 budget for preparation and reproduction (or purchase from others) of selected material. Materials that will be reviewed by the Committee (although not limited to) will include:

a. classroom materials and teacher's guides
b. video materials
c. handouts (brochures, posters, buttons, etc.)
d. lecture material for speakers bureau use
e. bill stuffer messages
f. displays for public gatherings (fairs, etc.)
g. displays for government buildings
h. displays for nurseries
i. materials suitable for public service spots, advertising, billboards

The committee will also review and recommend implementation strategies which shall consider the following:

a. slogan(s)
b. volunteer help
c. demonstration projects/gardens
d. media campaign
e. advertising campaign (sponsors)
f. contests
g. participation at public gatherings and events (fairs, etc.)
h. speakers bureau

Initial release of materials will be synchronized with Program Element 5.

2. Leak Detection

Goal: *"To minimize leakage of water from the distribution system."*

By June 1, all contractors will be surveyed and miles of different types of mains and historic unaccounted for water use will be determined and existing leak detection and control programs will be described. By December 31, 1982, a model leak detection program will be developed and described using current state of the art techniques based on the experience of utilities having aggressive and successful leak detection programs. Each contractor will consider implementing the model program by July 1, 1983.

3. Water Pricing

Goal: *"To eliminate pricing practices that encourage excessive consumption of water."*

The rates of all contractors will be reviewed. For any contractor retaining a quantity discount structure or flat rates, the viability of same will be examined

and by July 1, 1982, a recommendation prepared for the Board or Council involved. By January 1, 1983, a report will be prepared and submitted reviewing the state of the art in seasonal and increasing rate block design and applicability in the Sonoma-Marin service area of Sonoma County Water Agency.

4. Water Saving Devices (New Development)

Goal: *"See that all new development is equipped with state of the art water conservation devices."*

Devices and appliances suitable for new development (i.e., low flush water closets, shower flow controls, faucet aerator/flow controls, dishwashers, clothes washers) will be identified. Codes, regulations and agreements will be reviewed and redrafted to see that current requirements are consistent with applicable laws regarding use of shower flow controls and low flush water closets in new construction. Additional required use of other devices will be studied. Special attention will be given to devices affecting desirable flow reduction to the region's various sewage plants. North Marin County Water District's (NMCWD) program will be reviewed and other contractors will determine on a case by case basis whether they want to implement a similar program in their city or district. Recommendation for Councils and Boards will be prepared by September 1, 1982.

5. Water Saving Devices (Existing Development)

Goal: *"Increase penetration of retrofit devices distributed in 1976 and 1977."*

The cities of Santa Rosa, Rohnert Park, and Cotati, and two special districts operating in Sonoma County (South Park Sanitation District and Windsor County Water District) are currently involved in implementing wastewater treatment and disposal or reuse projects financed in large part by federal and state grants. Grant conditions require implementation of cost-effective flow reduction (water conservation) plans. To this end the State, through the Office of Water Conservation located in the Department of Water Resources, has offered to cover 75 percent of the cost of purchasing and distributing retrofit water conservation kits to existing households. These kits contain water saving tips, toilet tank displacement bags, shower flow inserts (disc type) and dye tablets and test procedures for checking for toilet tank leaks. State representatives believe that 50 percent subsidies could be offered to other agencies who participate in the distribution effort. One limitation on all agencies participating is that distribution be accomplished in calendar 1982.

To minimize local costs and coordinate efforts, the time table for distribution of kits will be moved up over previous estimates with the aim of obtaining agency approvals by June 1, finalizing selection of distribution materials, media information, etc., by July 1, 1982, and conducting the distribution campaign in early Fall of 1982.

6. Irrigation and Water Conserving Landscapes

Goal: *"Increase the utilization of efficient irrigation systems and water conserving plant materials."*

The WAC will investigate and develop information on efficient irrigation practices and techniques and on water conserving plant materials. This will be melded into the Consumer Education Program.

NMCWD has recently acquired $25,000 in funding for the water conserving plant program described in Exhibit A. The WAC will view this as a pilot program potentially applicable to their service areas. By January 1, 1983, the results of this program will be reviewed by the other contractors. Thereafter, components and strategies will be developed for implementation in the other cities and districts. Target date for implementing a program is Fall, 1983.

7. Regulations, Codes and Agreement Provisions

Goal: *"Regularly update regulations, codes, ordinances and agreement provisions implementing water conservation or discouraging wasteful use of water."*

With the first review to be completed by June 1, 1982, the WAC will thereafter annually consider modifications of regulations, codes, etc., to conform same to new legislation and, as necessary, the various ongoing initiatives in water conservation that are implemented by the WAC.

Reports and Follow-up

The Sonoma County Water Agency, acting as staff to the WAC, will by May 1, 1983, prepare (or have prepared) a report summarizing the status of the water conservation program and recommending changes in direction or strategy as deemed appropriate. The report will cover the following:

Water Conservation Plan

Sonoma County Water Agency Service Area

1. Introduction

2. The Goal, Objectives and Policies for Water Conservation/Flow Reduction in the Urban Area of Sonoma and Marin County

3. Alternative Water Conservation Elements and Implementing Strategies

   - Consumer Education
   - Leak Detection
   - Water Metering
   - Water Pricing
   - Water Saving Devices - New Development
   - Water Saving Devices - Existing Development
   - Irrigation Techniques and Water Conservation Landscapes
   - Regulations (Ordinances, Codes, Etc.)

4. Estimated Cost and Water and Energy Savings

   - Current Water Use
   - Projected (Year 2000) Water Use
   - Estimated Cost and Water Savings
   - Estimated Energy Savings

5. Follow Through and Assessment Plan Recommended

Annually thereafter, for a period of five years, a report recommending the theme and strategy for the ensuing year and containing information on the results of the last year's program will be prepared. After five years, the program will be reviewed.

NORTH MARIN COUNTY WATER DISTRICT

WATER CONSERVATION PLAN FOR 1982

Theme: Water Conserving Plants -
a "Makes Sense" Alternative

Sponsors: North Marin County Water District
(Lead Agency*)

Saratoga Horticultural Foundation

The San Francisco Foundation

This plan was prepared by John Olaf Nelson with assistance from Dennis White, Executive Director of the Saratoga Horticultural Foundation

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EXHIBIT A

☐ Primary Goal:

Achieve an awareness by water consumers that water conserving plants are an attractive, economical, and conservation oriented alternative to traditional landscaping.

☐ Basic Strategy:

- Consumer education via -
  1) bill stuffers
  2) advertisements
  3) drought tolerant plant demonstration garden
  4) District participation in local fairs
  5) Educational materials distributed at local nurseries
- Incentives for consumer participation -
  1) "two drought tolerant plants for price of one" program
  2) discount on connection fee to developers and new connectors who employ drought tolerant theme landscapes
- Effectiveness evaluation -
  1) follow-up consumer survey (bill stuffer or purchaser list)
  2) nursery sales under "two plants for one" program
  3) inventory of new dwelling units committed to drought tolerant landscape themes
  4) report
- Other ongoing related programs -
  1) devices in new construction required by District Regulation 15
  2) organization and implementation of classroom talks on water conservation in Novato Unified School District schools (K→6)
  3) participation in drought tolerant landscape research projects

☐ Specific Programs, Funding Requirements, Participants, and Implementation:

PROGRAM 1

Promoting the Use of Water Conserving Plants

by District Water Consumers

Participants: North Marin County Water District (NMCWD), Saratoga Horticultural Foundation (SHF), The San Francisco Foundation (SFF), and local nurseries/garden centers

Phase One - Introducing Consumers to Water Conserving Plants

General Description: Local nurseries would be invited to participate in the program. Specifically, they would be asked to set aside an area in their retail floor space for the assemblage and sale of drought tolerant plant species. The area would be clearly signed. SHF would work with the nurseries and see to it that a good selection of drought tolerant plants was offered. SHF would also supply plant labels and handout information that could be given to customers. Plant list catalogs would also be provided for sale. NMCWD would develop and make available handouts showing drought tolerant landscape layouts suitable for single family home application. NMCWD would offer rebates to the nurseries to enable a "two-for-one" drought plant sale extended over a three-month period (1-gallon plants). SHF would develop a bill stuffer and layout for local newspapers advertising the "two-for-one" sale. NMCWD would plant and carefully sign a water conserving demonstration garden in the high foot traffic entrance to its Novato headquarters. The garden would include over 18 species of plants and be readily available and on view to area residents and provide an example of the color and diversity available when selecting water conserving plants. SFF would grant funds for NMCWD's out-of-pocket costs. Phase One would start immediately and be concluded by July 31.

Specific Steps and Costs to NMCWD:

(1) Letter of invitation to local nurseries (NMCWD) ..... Nil Cost

(2) Preparation of art work and printing of bill stuffer (SHF and NMCWD) ..... $ 300

(3) Contact nurseries favorably responding to invitation, and:

(a) identify and list drought tolerant plant materials in current inventory (SHF and local nursery(s)).

(b) prepare supplemental list of drought tolerant plants to offer and identify source of supply (SHF and local nursery(s).

(c) SHF to work with local nursery(s) and reach agreement on:
- special floor display area and "signing"
- plant labeling
- information center and handout materials
- training of sales personnel

Items (3)(a) through (3)(c) ..... No Charge

(4) Prepare large signs for special drought tolerant sales areas:
- assume 4 main signs at $200 each ..... $ 800
- assume 4 x 4 "this way" pathway signs at $10 each ..... $ 160

(5) Prepare and print special handout materials:
- instructional material from SHF (10,000 copies) ..... $ 1,000
- typical drought tolerant landscape handout ..... $ 1,000

(6) Prepare and print special waterproof plant labels (SHF) ..... $ 500

(7) Prepare one-eighth page ads on "two-for-one" sale and run for 13 weeks:
- art work and layout (SHF) ..... $ 300
- Novato Advance (13 times) ..... $ 1,000
- Novato Buy Lines (13 times) ..... $ 1,000

(8) NMCWD to provide rebate to participating nurseries for "two-for-one" sale:
- limited to two 1-gallon plants per customer
- assume wholesale cost at $2.25/gallon plant
- assume retail value at $4.50/gallon plant
- assume customer pays $2.25 and NMCWD rebates $1.00 to nursery
- assume 25% of our 16,000 customers buy two plants; cost to NMCWD estimated to be 0.25 x 16,000 x $1,000 ..... $ 4,000

(9) News stories by local papers and SHF to supply articles for local garden column in Independent Journal, Novato Advance, etc. ..... No Charge

(10) Plant and label drought tolerant demonstration garden in front of District office ..... $ 2,800

(11) SHF to work with local nurseries to develop data base on retail sales against which the impact of the "two-for-one" promotion can be compared ..... No Charge

Phase Two - Follow Through Marketing Program

General Description: Continued "pressure" on customer supplied by weekly ads, series of articles on drought tolerant plants for local garden columns, newspaper stories on demonstration garden, and NMCWD research work and follow-up bill stuffer survey. Analysis of nursery sales data to determine impact of "two-for-one" sales program. NMCWD out-of-pocket costs to be financed by SFF. Phase Two would start in August and be concluded by November.

Specific Steps and Costs to NMCWD:

(1) Follow Phase One ads with weekly one-eighth page ads promoting drought tolerant plants:
- art work and layout (SHF) ..... $ 300
- Novato Advance (13 times) ..... $ 1,000
- Novato Buy Lines (13 times) ..... $ 1,000

(2) Series of articles prepared (or supplied) by SHF for local garden column in Independent Journal and Novato Advance ..... No Charge

(3) SHF to work with local nurseries and determine retail sales during the "two-for-one" campaign and attempt to quantify impact of drought tolerant plant promotion. SHF also at this point will again work with local nurseries to help them achieve a well rounded stock of drought tolerant plants ..... No Charge

(4) NMCWD to survey consumers with postcard-size bill stuffer questionnaire aimed at deriving information on effectiveness of introductory campaign and doubling as a repeat contact on the subject of drought tolerant plants ..... $ 200

(5) SHF to organize and conduct training seminars for local nursery personnel covering:

(a) drought tolerant plant knowledge

(b) drought tolerant landscape design from a plant culture viewpoint

(c) Maintenance of water conserving plants in the nursery environment

(d) use and design of drip irrigation systems and tips on irrigation water management

Estimated cost to NMCWD for this training program including preparation and reproduction of a workbook for each participant ..... $ 1,500

(6) SHF to work with participating nurseries to achieve nursery based landscape design service offering drought tolerant landscape theme alternative together with compatible irrigation systems (generally drip) ..... No Charge

(7) SHF to work with local nurseries to set up and conduct a series of seminars for the public covering the dry landscape approach including irrigation system tips. Approximately three seminars over a six-month period are envisioned. Cost to NMCWD including handout materials to be supplied by SHF ..... $ 1,500

(8) SHF, with input from NMCWD, to write report on Program 1 including analysis of penetration, effectiveness, impact on local nurseries, and conclusions and recommendations. This report, in addition to describing what was done and results obtained, would contain a section (drawing on the insights gained from the program) setting forth a useful guide for other agencies inclined to undertake such a program. Estimated cost to NMCWD ..... $ 3,000

Summary of Costs to NMCWD for Program 1:

Phase One (Spring and early Summer)

Bill stuffer notice	$ 300
Signs	960
Instructional material	2,000
Plant labels	500
Advertisements	2,300
Rebates to nurseries	4,000
Demonstration garden	2,800
	$12,860

Phase Two (Late Summer and Fall)

Advertisements	$ 2,300
Bill stuffer survey	200
Training Seminars	1,500
Public Seminars	1,500
Final Report	3,000
	$ 8,500
Total Cost of Program 1	$21,360

PROGRAM 2

Promoting the Use of Drought Tolerant Theme Landscapes in New Planned Unit Developments

Participants: North Marin County Water District (NMCWD), Saratoga Horticultural Foundation (SHF), The San Francisco Foundation (SFF), and developers, landscape architects and landscape contractors that work in the Novato area

General Description: A package of material containing lists and sources of drought tolerant plants suitable for use in the Novato area and including typical plan views of drought tolerant theme landscapes for planned unit developments would be prepared and would be distributed to applicants for water service. A training seminar would be held with landscape architects and landscape contractors known to work in the Novato area. The District would develop a connection fee discount applicable to developers who elect to employ drought tolerant landscape themes and would coordinate and gain acceptance of the program with the City of Novato and County of Marin Planning Departments and respective Design Review Committees. The program, once established, would be long term and essentially permanent with occasional review and updating of materials, discounts, and City and County plan review criteria. The program would focus on dissemination of knowledge, "volunteerism", and monetary inducements rather than mandatory regulations for its success. The program would be developed over the next six months with the aim of being in place and operative by Fall of 1981.

Specific Steps and Costs to NMCWD:

(1) Formation of an advisory committee consisting of two developer representatives (possibly an engineer and a landscape architect), a member representing the City of Novato's Design Review Committee, a member from the County of Marin's planning staff representing that agency's design review function, the Manager of NMCWD, and the Executive Director of SHF. The purpose of the Committee would be to act as a sounding board to proposals developed by NMCWD and accomplish coordination and implementation of program objectives with other affected parties and agencies ..... No Charge

(2) NMCWD would hire SHF and a landscape architect expert to prepare a package of materials that would be given to developers of planned unit developments. The materials would be aimed at the landscape architect and include typical plan layouts of drought tolerant theme projects including suitable irrigation systems, lists and sources of drought tolerant plants suitable for use in the Marin County area, and a brief guide to developing a drought tolerant theme landscape. Estimated cost of preparation and reproduction of this package of information is ..... $ 5,000

(3) NMCWD currently sets the "buy-in" component of its connection fee (this component is called the facilities reserve charge) as a function of the incremental cost to expand its basic utility plant (i.e., source, treatment, storage units, and major transmission mains and pumps). Expansion requirements are based on predictions of the water demand of new growth which in turn is a function of both inside and outside (irrigation) water use. The latter, of course, would be reduced for a development utilizing drought tolerant theme landscaping. In this step NMCWD would re-analyze the facilities reserve charge taking into account the impact of drought tolerant theme landscapes on the cost of expanding the basic utility plant and determine a suitable credit for such projects. As is the case with the current facilities reserve charge, the credit would be calculated and applied on a "per dwelling unit" basis. Implementing regulations would then be scheduled for hearing and subsequent consideration for adoption by the District Board of Directors. Estimated cost of the analysis is ..... $ 1,100

(4) SHF and the District's landscape architect committee would prepare and hold training seminars for area architects, developers, and landscape contractors for the purpose of disseminating information on the concepts of drought tolerant theme landscapes including specific information materials on plant lists, source and availability, drainage considerations, tips on early development, weed control, compatible irrigation systems, irrigation water management, etc. Estimated cost to NMCWD of seminars and materials is ..... $ 1,500

Summary of Costs to NMCWD for Program 2:

Applicants' Information Package	$ 5,000
Connection Fee Discount Analysis	1,100
Training Seminars	1,500
	$ 7,600

PROGRAM 3

Classroom Talks on Water Conservation

Participants: North Marin County Water District (NMCWD) and Novato Unified School District (NUSD)

General Description: Available education materials would be pulled together for Kindergarten through 6th gardes and Joe Kauwe, our resident teacher/draftsman, would be made available to NUSD for approximately 22 hours of classroom instruction time on water conservation. As a boost to the annual theme, children would be given handout material on water conserving plants to take home to Mom and Dad. It's expected that 4,400 children would be exposed to these classes.

Specific Steps and Costs:

(1) Purchase available handout materials and organize classroom presentation. Estimated cost of materials ..... $ 1,050

(2) Joe Kauwe's time for organizing presentation and presenting information before K through 6 classes ..... $ 1,000

Summary of Costs to NMCWD for Program 3:

Materials	$ 1,050
Joe Kauwe	1,000
	$ 2,050

PROGRAM 4

Participation in Drought Tolerant Plant Research Projects

Participants: North Marin County Water District (NMCWD), City of Santa Rosa, Mission Viejo Company, Metropolitan Water District, State of California Department of Water Resources, and Brown & Caldwell Engineers

General Description: A study of low water use landscapes for single family residences and multi-family residences has been developed by the author. Agencies supplying water use data are NMCWD, City of Santa Rosa, Mission Viejo Company, and Metropolitan Water District. The work would be conducted by Brown & Caldwell Engineers under contract to the Federal Department of Housing and Urban Development but fully financed by the State Department of Water Resources and the Metropolitan Water District of Southern California. NMCWD's role would be limited to providing water consumption information. The studies would compare the labor, energy and water requirements of drought tolerant landscapes vs. traditional landscapes in both the single family home setting and for planned unit developments.

Specific Steps and Costs:

Refer to descriptions of Project No. 9 and Project No. 10, attached. Cost impact on NMCWD ..... Nil

Excerpted from: PROPOSED RESIDENTIAL WATER CONSERVATION DEMONSTRATION PROJECTS
Contract H-5230; Task 2 - U. S. Department of Housing and Urban Development

Brown and Caldwell, Walnut Creek, California
January 1981

PROJECT NO. 9

STUDY OF LOW-WATER USE LANDSCAPING FOR SINGLE-FAMILY RESIDENCES

In much of the semiarid west where water development costs are amplified by the need for large storage and conveyance systems traditionally requiring substantial federal subsidy, one-half or more of all water supplied for domestic purposes is applied on landscaping. Remembering their eastern and European beginnings, most settlers in the west have adhered to traditional lush green landscapes requiring much water and intensive care during the long, virtually rainless, 7-month growing season. In this pursuit, a logical, equally satisfactory, and less expensive alternative involving use of low-water-using, native plants and other plants from semiarid climates (i.e., Mediterranean, Australia, etc.) has not been extensively utilized. Collection of data to quantify the benefits of this type of landscaping will help encourage further use of this type of landscaping.

Objective

To compare the labor, energy, and water required to maintain residences landscaped with conventional plants with those landscaped with low-water-using plants.

Technical Approach

The approach will be to select 12 detached single-family residences in sets of 2 each (i.e., 6 sets in all), and all having mature, relatively well-maintained landscapes and located in areas served by metered municipal water service. Each set of two homes will include one subdivision-type home, landscaped in the traditional way with expanses of lawn surrounded by border areas of water-loving shrubs or groundcovers. The second home making up the set will be located in the same subdivision adjacent to or in the immediate vicinity of the first home in order to minimize variables in the comparison (i.e., soil type, ground slope, microclimate differences, family economic status, etc.). This home will be landscaped with mature, drought-tolerant materials. Two sets will be located in the warm, inner coastal valleys of Northern California, two in Orange County in the Southern California plains area, and two in the Denver, Colorado, area.

For each residence, the following information will be determined:

1. Area landscaped in lawn and type of lawn.

2. Area landscaped with materials other than lawn (i.e., groundcover, shrubs, flowers, etc.) and identification of plant materials.

3. Area covered by structures, patios, walks, driveways, etc. (Residences with pools will not be used in the study. To the extent possible, each set will consist of two lots very similar in shape and size and with homes similarly oriented with regard to the sun and similarly shaded with regard to tree canopy, if any.)

4. Type and location of irrigation system (only homes with lawns irrigated by an in-ground sprinkler system will be used).

5. Family attitude toward landscape and method of maintenance (professionally maintained landscape will not be used in sample).

Over the course of one water year (a winter followed by the ensuing growing season) and with the cooperation of the residents, the following data will be collected on a monthly basis:

1. Rainfall per set (one rain gage will be installed for each set).

2. Pan evaporation per set (one evaporation pan, protected from animals and birds by wire, will be installed per set and will be read weekly during the peak growing season).

3. Applied landscape water (water used outside the house for landscape watering will be separately metered) per residence.

4. Fertilizer will be supplied to each residence free of charge and a fertilization schedule will be suggested and records on the use of fertilizer maintained.

5. Qualitative assessment of the appearance of the landscape for each residence.

6. Hours of landscape maintenance labor expended per residence.

From the foregoing and data available from the utility and area climatological stations, the following information will be compiled: profiles of applied water, applied water as percent

of potential evapotranspiration, indirect and direct energy expenditures, labor expenditures versus qualitative landscaping, etc. Comparisons will then be made between the two residences in each set and between the drought-tolerant and the traditionally landscaped residences.

Sample Size

Six sets of 2 residences for a total of 12 residences. Each set will include one conventionally landscaped home and one landscaped with low-water-using plants.

Data Collection Method

All data will be collected by the homeowner except monthly assessment of appearance which will be completed by Brown and Caldwell. Separate meters will be installed to measure all landscape irrigation water use. Meters will be installed and read by the water utility.

Project Outputs and Milestones

Interim reports will be prepared describing site selection and description, equipment installation, and data collection and analysis. A final project report will be prepared for the entire project. The resulting report could be summarized and printed in a brochure-type flyer and shared with nurserymen, landscape architects, landscape contractors, state and local agencies, and water utilities who, in turn, can use the same to educate and encourage homeowners to utilize lower cost, attractive, and efficient drought-tolerant landscpaping. Cost of the summary is not included.

Project Schedule

The investigation will cover a period of 18 months beginning March 1, 1981 divided as follows: sample selection and preparation--3 months; data collection--1 water year; and report write-up--3 months.

Labor Hours and Cost

Estimated project labor requirements and project costs are shown in Table 1.

PROJECT NO. 10

STUDY OF LOW WATER USE LANDSCAPING FOR MULTIPLE-FAMILY RESIDENCES

As construction of multiple dwelling units in planned unit development expands their dominance over the new housing market,

Table 1. Labor Hours and Cost for Project No. 9 - Nationwide

Task/cost item	Brown and Caldwell				Utility maintenance	Horticultural consultant	Direct costs, dollars
	Supervising engineer	Engineer	Technical	Clerical			
Sample selection	8	20		4		10	150
Installation of rain gauges, evaporation stations, and meters	8	16			40	4	2,200
Project formation, field work, and mapping	20	48	100	20		26	250
Data collection and analysis	30	60	120	20		10	350
Report preparation	96	48	40	30			250
Total man-hours	162	192	260	74	40	50	
Billing rate, dollars/hour	55	32	20	20	20	40	
Cost, dollars	8,910	6,144	5,200	1,480	800	2,000	3,200
Total cost,[a] dollars	30,500						

[a]Includes fixed fee of 10 percent.

the opportunity to implement attractive drought-tolerant theme landscapes expands dramatically. Because of the consolidation of outside spaces in such projects, the lack of view-disrupting fences, and the resulting larger blocks of landscape area, the landscape architect is presented with a unique opportunity to implement pleasing mixtures of bright green lawns in high visual impact areas and attractive shades of low maintenance, drought-tolerant theme projects does not appear to be reduced. Also, the wide variety of colorful highlights available from drought-tolerant plants in other areas. The end result can be an aesthetically pleasing project with a greatly reduced lawn area. result in the drought-tolerant theme project having a much more interesting and attractive balance of color.

The results of this project are judged extremely useful. For the first time, water managers, landscape architects, and others will have the hard data and cost information necessary to convince developers of the merits of utilizing drought-tolerant theme projects. The data and results will also be of value to state and local agencies who must plan for future water needs. utilities and other agencies will have information supportive of regulatory decisions which either encourage or outright require utilization of drought-tolerant landscape materials.

Objective

To compare the water, energy, and labor requirements of conventional landscaped multifamily developments with those landscaped with low-water using plants.

Technical Approach

To establish baseline information on traditionally landscaped projects, a group of approximately eight planned unit developments with mature traditional landscapes will be selected. Criteria used in the selection include consideration of the following: projects served solely by municipal water utilities, projects whose outside irrigation uses are separately metered, and projects having a wide range of landscape area (especially lawn area) per dwelling unit. These 8 planned unit developments have been tentaively selected and together certain approximately 738 dwelling units.

Six drought-tolerant theme projects will be selected for comparison. Although examples of planned unit developments landscaped with a drought-tolerant theme are rare, Marin County in Northern California's warm coastal valley has a number of such projects, and there are several in Mission Viejo in Orange County.

Of the six developments, two are hybrid-type projects containing both conventional and drought-tolerant plants.

For each development, the following information will be determined:

1. Number of dwelling units.
2. Area landscaped in lawn and type of lawn.
3. Area landscaped in other than lawn and list of plants.
4. Type of irrigation system, controls, shrub beds separately irrigated and timed, etc.
5. Landscape maintenance arrangements, contracts, cost, etc.
6. Irrigation scheduling, frequency, duration, seasonal changes, etc.
7. Soil information from plans.
8. Available climatic information.

Over the course of one water year (a winter followed by the ensuing growing season), the following data will be collected on a monthly basis:

1. Rainfall per project (one rain gage will be installed in each project).
2. Pan evaporation per project (one evaporation pan, protected from animals and birds by wire, will be installed in each project and will be read weekly during the peak growing season).
3. Applied landscape water (some additional separate metering is required in one of the drought-theme projects).
4. Applied fertilizer (from landscape contractor).
5. Hours expended on landscape maintenance (from landscape contractor).
6. Qualitative assessment of landscape appearance.
7. Cost to homeowner's association for landscape maintenance (from homeowner's association).

From the foregoing and data available from the utility and area climatological stations, the following information will be compiled: profiles of applied water, applied water as percent

of potential evapotranspiration, indirect and direct energy expenditures, labor expenditures versus qualitative landscaping, etc. All traditional landscaped projects will then be analyzed and relationships determined such as the consumption of water per dwelling unit and maintenance cost per dwelling unit versus square footage of landscaped area per dwelling unit. Similar information for the drought-tolerant theme projects will be calculated from the data and compared to the traditional landscaped projects and conclusions drawn.

Sample Size

The proposed developments that will be included in this project are shown in Table 1. This sample may be revised when the project is finalized.

Data Collection Method

Table 2 identifies the source and method for collection of data.

Project Outputs and Milestones

Interim reports will be prepared describing site selection and description, equipment installation, and data collection and analysis. A final project report will be prepared for the entire project.

Project Schedule

The investigation will cover a period of 18 months beginning September 1, 1981, divided as follows: sample selection and preparation--3 months; data collection--1 water year; and report write-up--3 months.

Labor Hours and Cost

Estimated project labor requirements and project costs are shown in Table 3.

Table 1. Multiple-Family Project Sites in California for Project No. 10 - California

Location and name of site	Number of dwelling units	Type of landscape[a]
Novato (Marin County)		
Deerfield	14	T
Village Marin-Meadows	116	T
Village Marin-Hillside	58	T
Crossroads Village	38	T
Village Marin-The Woods	148	D
Silva Apartments	30	T
Site to be selected	~200	T
Ignacio Creek	79	D
Crossroads to townhomes	182	T
Santa Rosa (Sonoma County)		
Oak Forest	43	D
San Rafael (Marin County)		
The Meadows	225	H
San Ramon (Contra Costa County)		
The Gardens	124	H
Mission Viejo (Orange County)		
Site to be selected	~100	D
Site to be selected	~100	T
Total	1,457	

[a]Code for type of landscape:
T - Traditional wet-type turf and plants.
D - Drought-tolerant theme projects (may contain bluegrass areas).
H - Hybrid landscapes, including bluegrass, wet and dry plants, and groundcovers.

Note: Sum of T-type landscapes: 738 units
Sum of D-type landscapes: 370 units
Sum of H-type landscapes: 349 units

Table 2. Source and Method for Collection of Data for Project No. 10 - California

Data	Source
Rainfall	Individual project rain gauge--homeowner
Pan evaporation	Individual project evaporation pan--homeowner
Applied landscape water	Separate outside water meters (present in all developments except one)--local utility
Applied fertilizer	Landscape maintenance contractor
Labor expenditure	Landscape maintenance contractor
Cost for maintenance	Homeowners association
Qualitative assessment of appearance	Monthly site visit--Brown and Caldwell
Temperature and potential evapotranspiration	Area climatological stations--Brown and Caldwell

Table 3. Labor Hours and Cost for Project No. 10 - California

Task/cost item	Brown and Caldwell				Local utility			Direct costs, dollars
	Supervising	Engineer	Technical	Clerical	Maintenance	Meter reader	Horticultural consultant	
Sample selection	20	40		8			10	150
Installation of rain gauges, evaporation pans, and meters	10	16			125		10	3,950
Project formation, field work, and mapping	32	100	160	20			70	350
Data collection and analysis	100	120	240	40	25	100	10	1,250
Prepare report	120	100	40	30				400
Total man-hours	282	376	440	98	150	100	100	
Billing rate, dollars/hour	55	32	20	20	20		40	
Cost, dollars	15,510	12,032	8,800	1,960	3,000	2,000	4,000	9,100
Total cost,[a] dollars	62,040							

[a]Includes fixed fee of 10 percent.

Exhibit 2

SONOMA COUNTY WATER AGENCY

November 24, 1987

File: 40-0-1 Plans & Programs
42-4.1-9
42-6.1-9

O.P. Gulati
Water Conservation Coordinator
California State Water Resources Control Board
Division of Water Rights
P.O Box 2000
Sacramento, CA 95810

Dear Sir:

Enclosed is a copy of the Water Conservation Plan outline addressing specific points contained in the plan guidelines received from your office in October of 1986. The plan has been prepared in response to the October 7th letter from Raymond Walsh regarding the Sonoma County Water Agency's request for a time extension in preparing the plan. We trust that the outline will provide sufficient background material on the Agency's operation to make a determination on our request.

It is expected that the Agency will begin its cost effectiveness analysis as a pilot agency with the Department of Water Resources' contractor for development of their Water Conservation Plan Guidelines by early January 1988. At that point it will be possible to move forward with the cost effectiveness analysis of the alternative water conservation measures identified by the Agency's Water Conservation Committee. Without yet being able to meet with DWR's contractor, it is difficult to anticipate the time frame for carrying out the analysis. However, the guidelines are expected to be completed and available by late 1988, and the analysis can be expected to be complete at that time. At that point, the results of the analysis can be submitted to the committee for their review and approval, after which the finalized plan can be submitted to the SWRCB for review.

File: 40-0-1
42-4.1-9
42-6.1-9

Please call me at (707) 526-5370 if you should require any additional information.

ROBERT F. BEACH
General Manager

Encl.

ug:jimf/wc1610/wc.1

SONOMA COUNTY WATER AGENCY

Water Conservation Plan Outline

OUTLINE OF

URBAN WATER CONSERVATION PROGRAM DOCUMENTATION

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2. WATER RATES RESOLUTION

3. LIST OF WATER CONSERVATION LITERATURE/FILMS

4. PUBLIC SERVICE ANNOUNCEMENTS

5. ANALYSIS OF RADIO ADS

I. Basic Analysis

A. Vicinity map with study area boundaries (SCWA Service Area Map attached - See Figure C-1)

B. Statement of water conservation goals and objectives

SUMMARY

The Sonoma County Water Agency delivers water to over 275,000 people in its service area, which covers most of the urban portions of Sonoma County plus the North Marin County Water District (see Figure C-1). By working together under the lead of the Sonoma County Water Agency, the participating water contractors have developed and have been implementing a comprehensive water conservation program for many years. The Agency's updated Water Action Plan (see Appendix 1) identifies the water supply situation within the Agency's service areas and includes the following goals and objectives:

- To ensure that water of good quality is available in sufficient quantities for present and future beneficial use.
- To continuously increase consumer awareness about the need for and benefits of water conservation.
- To minimize leakage and water loss from the various distribution systems.
- To review and evaluate pricing practices that might encourage excessive consumption of water.
- To ensure that all new and existing development is equipped with state-of-the-art water conservation devices and practices.
- To regularly update ordinances, regulations, and service agreement provisions implementing water conservation and discouraging wasteful use of water.

The Urban Water Management Plan, prepared in 1985, explored in detail the feasibility, cost, and effectiveness of several water conservation measures. It provided considerable background material on the Sonoma County Water Agency's water supply capability. It is critical to note that, although the Sonoma

County Water Agency was responsible for preparing the Urban Water Management Plan, the authority to implement the measures discussed resides with each of the eight water contractors (cities and districts) within their service areas. The Sonoma County Water Agency cannot enforce compliance with or implementation of, measures to conserve water within the service areas of the water contractors. The thrust of the recommended actions contained throughout the plan was to encourage compliance through cooperation.

This plan has been prepared in accordance with the terms of amended permits issued pursuant to Decision 1610 by the State Water Resources Control Board (SWRCB) on a series of applications by the Sonoma County Water Agency concerning its water rights in the Russian River System.

In its petitions, the Agency sought the right to rely primarily upon natural streamflow supplemented by water released from storage in Lake Sonoma rather than Lake Mendocino to supply the water system Russian River diversion demands. The Agency also sought to preserve its historical rights in the Coyote Valley Dam Project in Mendocino County. These rights have a very substantial monetary value and are needed to satisfy the water needs of the Ukiah, Hopland and Alexander Valleys which are dependent on the Russian River upstream from Dry Creek. The decision granted to the Agency the rights which were sought subject to various conditions.

The amended permits provide that:

> "Permittee shall consult with the Division of Water Rights and develop and implement a master water conservation plan for its service area. The proposed plan shall be presented to the State Water Resources Control Board for approval within one year from the date of issuance of this amended permit or such further time as may, for good cause shown, be allowed by the Board. A progress report on the development of the master water conservation plan may be required by the Board at any time within this period.
>
> All cost effective measures identified in the master water conservation plan shall be implemented in accordance with the schedule for implementation found therein."

In this plan the Agency seeks to further investigate the cost effectiveness of additional water conservation alternatives, and to further develop the cooperative relationship with its water contractors to implement those measures found to be cost effective in accordance with the schedule to be adopted.

C. Study area characteristics

1. General description of land use and land use trends which may affect water demands

SONOMA COUNTY WATER AGENCY SERVICE AREA

INTRODUCTION

This chapter summarizes past and present water use in the Sonoma County Water Agency service area. Estimates of population, housing, employment and water use are presented based on projections of demographic, economic, and land use data consistent with cities' and counties' general plans, and water consumption data collected by SCWA.

REGIONAL SETTING

The region discussed in this report consists of the Russian River basin in Sonoma County and those service areas of Sonoma County and North Marin County outside the basin but served by the SCWA. Table C-1 is a listing of cities and districts with their populations, served by the SCWA.

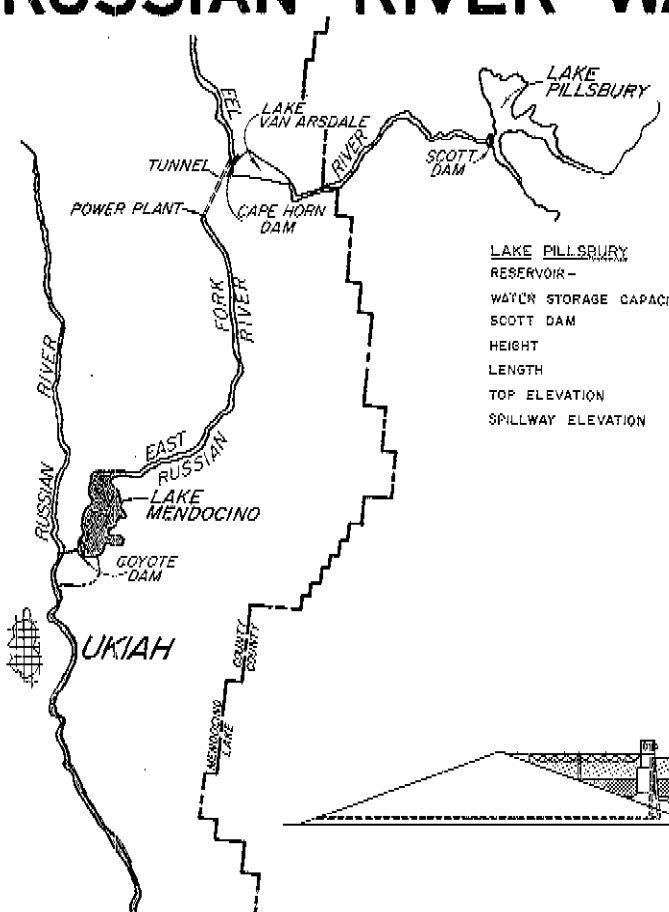
Table C-1

SONOMA COUNTY WATER AGENCY SERVICE AREA
GENERAL CHARACTERISTICS REPORTED
BY CONTRACTING AGENCIES IN MAY 1985 SURVEY

City/Water Districts	Population	Total Water Connections
Forestville	1,500	730
Valley of the Moon	9,500	(active) 5,303
Sonoma	6,860	2,760
Cotati	4,000	1,340
Rohnert Park	29,000	6,407
Santa Rosa	94,621	27,300
Petaluma	37,288	12,339
North Marin	50,590	15,403
TOTALS	233,359	71,582

THE RUSSIAN RIVER WATER SYSTEM

CONSERVATION – TRANSMISSION
FLOOD CONTROL – RECREATION



LAKE MENDOCINO

RESERVOIR-		
WATER SUPPLY POOL	70,000	A.F.
FLOOD CONTROL POOL	48,000	A.F.
SILT STORAGE	4,500	A.F.
TOTAL	122,500	A.F.
COYOTE DAM		
HEIGHT	151	FT.
LENGTH	3,532	FT.
TOP ELEVATION	784	FT.
SPILLWAY ELEVATION	765	FT.

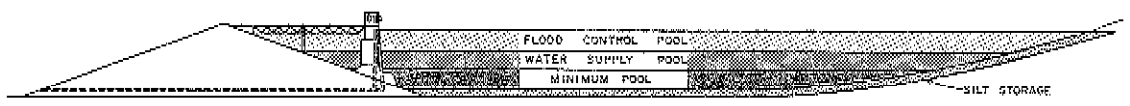
LAKE PILLSBURY

RESERVOIR –	
WATER STORAGE CAPACITY	86,388 A.F.
SCOTT DAM	
HEIGHT	130 FT.
LENGTH	805 FT.
TOP ELEVATION	1,838.5 FT.
SPILLWAY ELEVATION	1,818.3 FT.

LAKE SONOMA

RESERVOIR-		
WATER STORAGE POOL	212,000	A.F.
FLOOD CONTROL POOL	130,000	A.F.
MINIMUM POOL	13,000	A.F.
SILT STORAGE	26,000	A.F.
TOTAL	381,000	A.F.
WARM SPRINGS DAM		
HEIGHT	319	FT.
LENGTH	3,000	FT.
TOP ELEVATION	519	FT.
SPILLWAY ELEVATION	495	FT.

TYPICAL MULTIPURPOSE RESERVOIR
OF THE
RUSSIAN RIVER PROJECT



LEGEND

- STREAM CHANNELS USED FOR CONDUITS
- EXISTING AQUEDUCTS SONOMA COUNTY
- EXISTING NORTH MARIN AQUEDUCT
- EXISTING PUMPING PLANTS
- EXISTING STORAGE TANKS
- EMERGENCY WELLS
- S.C.W.A. SERVICE AREAS

GENERAL LOCATION MAP

1985

SCWA's service area, including the North Marin District (see Figure C-1), both within and outside the Russian River basin includes the most heavily populated urbanized areas in Sonoma and North Marin Counties. In fact, the Cities of Santa Rosa and Novato are projected to emerge as two of the twenty largest population centers in the nine-county San Francisco Bay Area by the year 2000.

Sonoma County's General Plan is a "community-centered" concept of land use and calls for the proportion of future growth that is to occur in the incorporated cities and unincorporated communities of the county to be greater than it has been in the past. The Plan states "in 1975, about sixty-nine percent of the county's people resided in these communities; implementation of the land use plan would increase this percentage to seventy-nine percent." Of particular importance is the assumption that sixty-eight percent (68%) of the county's year-2000 population would live in the eight existing cities within the county--five of these cities are customers of SCWA's water system. A new General Plan is currently in the draft phase and is tentatively scheduled for adoption in late 1988.

2. Drainage Basin

The Russian River drains a basin of 1,485 square miles in Sonoma and Mendocino Counties. The drainage basin, lying between adjoining ridges of the Coast Range Mountains, is about 80 miles long and from 10 to 30 miles wide. The total length of the river, from its source about 16 miles north of Ukiah to its mouth at Jenner, where it empties into the Pacific Ocean, is about 110 miles. Principal tributaries of the Russian River are Dry Creek and Mark West Creek. Dry Creek drains an area of 217 square miles in the west central portion of the drainage basin and empties into the Russian River about 2 miles south of Healdsburg. Mark West Creek drains an area of 254 square miles located in the southeastern portion of the drainage basin and joins the main stream at Mirabel Park. The areas in southern Sonoma County and northern Marin County served with Russian River water drain into San Pablo Bay through large estuaries such as Sonoma Creek, the Petaluma River, and Novato Creek.

3. Climate

The climate of the Russian River basin is tempered by the proximity of the Pacific Ocean. In common with much of the California coastal area, the year is divided into a wet and dry season. The mean annual rainfall for the Sonoma County Water

Agency Service Area is approximately 30 inches. Winters are cool, but below-freezing temperatures are seldom experienced. Summers are warm and the frost-free season is fairly long.

4. Land Use

At the present time, the Russian River drainage basin is primarily an agricultural area with the greatest emphasis on orchard crops and vineyards. The basin is one of the important wine-grape producing centers of the United States with vineyards located along all of the river valleys and some of the major tributaries. The Sonoma County agricultural crop reports indicate the acreage devoted to wine-grape production has more than doubled in recent years to a total of more than 30,000 acres. Major orchard crops consist of prunes, pears and apples, with some production of other crops such as cherries and walnuts.

Recreation is also a major industry in the Russian River valley. In addition to recreational development at Lake Mendocino and Lake Sonoma, the Russian River itself is used extensively for water contact sports and is purportedly the most heavily used stream for canoeing in the nation. Along the river reaches adjacent to Healdsburg and in the area lying between Mirabel Park and Duncan Mills, there are a significant number of summer homes and resorts.

2. Population projections of study area

Population projections for individual water contractors and total population are shown below in Table C-2. Except where noted the projections were provided by water contractor staff.

TABLE C-2

SERVICE AREA POPULATION PROJECTION

Contractor	1980	1990	2000	2005
Santa Rosa	109,200	134,600	160,500	169,700
North Marin	51,550	59,550	70,450	73,050
Petaluma	33,850	41,700	53,500	58,700
Valley of the Moon	13,700	17,000	21,200	24,000
Sonoma	7,050	9,000	11,250	12,350
Rohnert Park	23,300	36,300	51,250	58,700
Forestville	1,300	1,900	2,700	3,100
Cotati*	4,200	5,500	6,600	6,700
Total	244,150	305,550	377,450	406,300

* From 1987 Association of Bay Area Governments (ABAG) projections

D. Water supply characteristics and facilities

1. Description of all wholesale and retail entities, general responsibilities and relationships among agencies, including map of boundaries of cities and wholesale and retail water supply entities in study area

HISTORY OF THE SONOMA COUNTY WATER AGENCY

The Sonoma County Water Agency, founded originally as the Sonoma County Flood Control and Water Conservation District, serves a population of more than one-quarter-million people today. The Agency is a special district formed by Chapter 994 of the State Statutes of 1949, as amended, and operates under the direction of the Sonoma County Board of Supervisors acting as the Agency's Board of Directors.

The Russian River is a major fresh water source for three counties: Mendocino, Sonoma, and Marin. Water from the Russian River is wholesaled directly by the Sonoma County Water Agency to eight north coast cities and county water districts. These eight major contractors, in turn, retail water to approximately 70,000 water connections. Over 80% of these water connections service residential meters.

Historically, the Agency has been in the business of guaranteeing the secure supply and delivery of Russian River water to the urban population of southern Sonoma County and North Marin County. Today, the Sonoma County Water Agency is not only responsible for the capture and delivery of water through an elaborate system (see Figure C-1), but is deeply involved with the conservation and preservation of local water resources.

In 1908, the predecessor of Pacific Gas and Electric Company (PG&E) built a small reservoir (Van Arsdale) on the Eel River with a transbasin diversion tunnel and powerhouse into Potter Valley in the Russian River basin. Although designed originally to produce power, the water diversions at Potter Valley substantially increased the summer flows in the Russian River. The construction of Lake Pillsbury and Scott Dam in 1921 added water storage, which in 1959 totaled 86,000 acre-feet (see map at the end of this section).

Following a series of disastrous floods along the Russian River in the 1930's, a study by the U. S. Army Corps of Engineers concluded two dams should be constructed in the Russian River Watershed for flood control. A plan for the region's water resource development was given political endorsement in 1955,

when the electorate of the Sonoma County Water Agency authorized general obligation bonds to finance the water supply portion through construction of Coyote Dam and Reservoir on the east branch of the Russian River above Ukiah. Coyote Valley Dam was completed in 1959, and began to supply water to an aqueduct and transmission system built and operated by the Sonoma County Water Agency that same year. The water delivery system at that time consisted of two Ranney-type water collectors and the Santa Rosa Aqueduct. The Forestville, Petaluma, Sonoma, and Marin (owned by North Marin County Water District) Aqueducts were subsequently added over the next several years. The second phase of the Corps' and Water Agency's Russian River Project, the Warm Springs Dam, located on Dry Creek northwest of Healdsburg, was authorized by Congress in 1962 and construction was completed in 1984.

Rapid growth in the late fifties and sixties caused water sales to leap from 6,000 acre-feet in 1960 to 26,000 acre-feet fourteen years later. By 1969, a water management plan was devised to deal with large escalations in demand experienced throughout the sixties. The Russian River Water Plan proposed an expanded project that would double existing aqueduct capacity. The Russian River-Cotati Intertie was viewed as a mutually advantageous project by the Agency's major contractors, as several were scheduled to reach their aqueduct entitlements in the existing transmission system by 1974.

This major expansion of the Aqueduct system was initiated in 1974. A master agreement was entered into on October 25, 1974, between the Sonoma County Water Agency (referred to as SCWA hereafter) and SCWA's eight principal water contractors: the City of Cotati, the City of Rohnert Park, the City of Santa Rosa, the City of Petaluma, the City of Sonoma, and the County Water Districts of Forestville, Valley of the Moon, and North Marin. The contract set forth the major features of the Intertie Project and delivery commitments therefrom and specified capacity rights in the expanded aqueduct system.

The agreement consummated in 1974 was intended to provide for a water supply to carry all contracting communities through at least the mid-1990's. Rohnert Park, reliant on groundwater supply, chose to insure against overdraft by contracting for one million gallons per day (MGD) from the Aqueduct System.

The Water Advisory Committee

The Water Advisory Committee (WAC) was formed as part of the terms of the water supply agreement of 1974. A representative from each of the eight major contracting agencies is a member of this committee which serves to pass and review the Agency's budget, and to make policy recommendations. On the WAC, votes

are apportioned by Aqueduct entitlement, or the entitlement of each contractor to water from the system.

The Water Advisory Committee is presently chaired by the General Manager of North Marin County Water District. The Committee members include:

General Manager, North Marin Water District
Director of Public Works, City of Santa Rosa
City Manager, City of Petaluma
City Engineer, City of Rohnert Park
Director of Public Works, City of Sonoma
City Manager, City of Cotati
General Manager, Forestville County Water District
General Manager, Valley of the Moon Water District
General Manager, Sonoma County Water Agency

The SCWA's responsibility is to produce water and to operate and maintain all the facilities in the distribution system insofar as they connect with and supply the city and special district systems represented on the WAC Board. The final policy makers are the Sonoma County Board of Supervisors who serve as the Board of Directors for the SCWA.

Water transport is expensive; therefore, in carrying out its programs for meeting the demands of its member contractors, the SCWA encourages the efficient use of water in its service area, and operates and maintains its aqueduct and distribution system to maximize its efficiency. In connection with encouraging the efficient use of water, the SCWA participates in many water conservation and management programs.

In 1981, the WAC Board decided to launch a long-term, comprehensive conservation program designed to insure both the wise use of the region's water resources and to optimize use of the region's sewage treatment facilities. A water conservation coordinator (referred to as the Coordinator) was hired in February, 1982. The following is a budget summary of the conservation program's financial activities through the current fiscal year:

Fiscal Year	1982/83	53,182	(Actual)
Fiscal Year	1983/84	37,732	(Actual)
Fiscal Year	1984/85	58,171	(Actual)
Fiscal Year	1985/86	66,386	(Actual)
Fiscal Year	1986/87	68,279	(Budgeted)

SCWA contractors recognize the community of interests that are dependent on the Russian River resource. The local mixed economy generates a variety of water demands: fish and recreational uses, agricultural interests, commercial users and a

growing urban population all depend on the Russian River. The purpose of the ongoing water conservation program essentially is to live in better harmony with this community of vital interests by considering and implementing alternatives which will put the local water resources to their best and most efficient use.

2. Description of all sources of water for study area and major facilities

Russian River System

Potter Valley Project

The Potter Valley Project, constructed in 1908 and now owned and operated by Pacific Gas and Electric Company, greatly increases the flow in the Russian River by diverting water from the South Fork of the Eel River through a tunnel to the East Fork Russian River. The project is located in Lake and Mendocino Counties, approximately 15 miles northeast of the City of Ukiah. Scott Dam, which was added in 1921, forms Lake Pillsbury. It is located on the Eel River approximately 17 miles upstream from the tunnel diversion. The diversion dam, called Cape Horn Dam, forms Van Arsdale Reservoir.

Lake Pillsbury began storing water in December, 1921, and had an original storage capacity of 94,400 acre feet. Sedimentation is a serious problem at Lake Pillsbury. In May, 1959, the U.S. Geological Survey found that sedimentation had reduced the gross storage capacity to 86,800 acre feet. An additional survey performed in April, 1984, found the storage capacity further reduced to 81,200 acre feet. The lake has a surface area of 2,280 acres at the normal maximum pool elevation. Releases from Lake Pillsbury are made through a 72-inch diameter, riveted-steel outlet pipe passing through the bottom of the dam.

Van Arsdale Reservoir, the forebay formed by Cape Horn Dam, originally had a storage capacity of 1,500 acre feet. Over the years, however, siltation has reduced the reservoir depth to just a few feet. The reservoir area is about 100 acres at normal maximum water surface elevation.

The Potter Valley Tunnel conducts water from Van Arsdale Reservoir through the Eel-Russian River basin divide to the Potter Valley Powerhouse, some 9,200 feet south of the reservoir. Discharges from the three Potter Valley Powerhouse generating units join together into a common channel about 50 feet downstream from the powerhouse. The first 25 feet of the common channel form the head works for two Potter Valley Irrigation District canals.

Water not diverted to the irrigation district flows through a venturi flume into the tailrace canal. There are two concrete erosion check dams located downstream of the venturi flume on the tailrace canal. There are sixteen additional check dams downstream of the tailrace canal in the East Fork Russian River. Although located in Mendocino County, these are maintained by the Agency under an agreement with Pacific Gas and Electric Company.

Coyote Valley Project

Coyote Dam, located on the east branch of the Russian River just north of the City of Ukiah, was completed by the Corps of Engineers in 1959. The dam, an earthfill structure, is 3,500 feet long and 160 feet high. Lake Mendocino, the reservoir formed by the dam, is approximately three miles long and one mile wide with a surface area of 1,731 acres when filled to the top of the water conservation pool. It has a storage capacity of 122,500 acre feet, of which 70,000 acre feet is allocated to water supply. In addition, a 22,000 acre feet encroachment into the flood control storage space is permitted for water supply purposes after April 1st of each year.

Construction of the dam, as authorized by the Flood Control Act of 1950, was contingent upon local interests making a cash contribution to the Federal Government in full repayment of the water supply benefits of the project. In March, 1956, the Sonoma County Water Agency made the required contribution. Nine months later, the Mendocino County Russian River Flood Control and Water Conservation Improvement District reimbursed approximately 11 percent of the payment made by the Agency for the right to consumptively use 8,000 acre feet per year of project water.

Warm Springs Dam Project

The Warm Springs Dam/Lake Sonoma Project is located in Sonoma County at the confluence of Warm Springs Creek and Dry Creek approximately 14 miles northwest of Healdsburg and approximately 70 miles northwest of San Francisco. The project was authorized by the Flood Control Act of 1962. Authorized purposes of the project are flood control, water supply, and recreation.

The dam is a rolled earth embankment with a crest elevation 319 feet above the streambed. Curved on a 6,000 foot radius, the dam crest extends approximately 3,000 feet across the stream channel and measures 30 feet wide. Width of the dam at its base is 2,600 feet.

Lake Sonoma, the reservoir created by the dam, has a capacity of 381,000 acre feet at the spillway crest elevation of 495 feet. Of this total capacity, 130,000 acre feet is allocated for flood control, 212,000 acre feet for water supply, and 13,000 acre feet to maintain the reservoir's warm water fishery. The additional

26,000 acre feet is reserved for silt accumulation. With the water level at the spillway crest Lake Sonoma has a surface area of 3,554 acres.

Under a contract with the Federal Government, the Sonoma County Water Agency controls the entire 212,000 acre feet of water supply storage space in Lake Sonoma.

SCWA Intake Facilities

The Agency currently pumps from the Russian River at two sites in close proximity to each other located near Forestville. Contracted amounts to the Agency's contractors total 92 MGD and the actual maximum demand has reached 65 MGD on July 10, 1985. Intake facilities of the Russian River system presently include two collectors at Wohler and three at Mirabel, of the Ranney type. The combined capacity of the existing intake facilities is as follows:

Wohler Collector Nos. 1 and 2	30 MGD
Mirabel Collector Nos. 3, 4, and 5	62 MGD
Total	92 MGD*

*Figures in million gallons per day

Maximum diversion from the Russian River system occurred during the 1986-87 water year and totaled 48,398 acre feet.

Additionally, the Agency has three deep emergency wells constructed along its aqueduct lines on the Santa Rosa plains. The wells are linked directly to the aqueduct and are capable of producing 6.5 MGD. The wells were constructed as a response to the 1976-77 drought in the event the drought continued. They also can act as an emergency supply on a short-term basis.

The Agency does not purchase water from anyone else.

Role of SCWA as manager of the Russian River Projects

Mendocino, Sonoma and Marin Counties are all dependent on the Russian River for water supply. Nevertheless, because the Agency is the local sponsor for the two Corps of Engineers dam projects on the Russian River and because it therefore controls water releases from the water supply storage space in the reservoirs, the Agency has the primary responsibility for managing the system. Beneficiaries of the projects include Mendocino and

Sonoma County agriculture, municipal water suppliers in all three counties, fish and wildlife, and recreation - both instream and at the reservoirs.

3. Description of present groundwater management and recharge and overdraft problems, if any

The emergency wells, although constructed to alleviate possible shortages in the Russian River supply, have never been operated on a continuous basis. Consequently no recharge, overdraft, or management problems have been experienced.

4. Estimate of past, current and projected water use, segregated to the extent that records are available, between residential, industrial, commercial and governmental sectors*; per capita demands

WATER USE

CURRENT DELIVERIES BY SONOMA COUNTY WATER AGENCY

Water from the Russian River is wholesaled directly by the SCWA to eight north coast major contractors who in turn, retail water to approximately 70,000 water connections including industrial, commercial, domestic, and some agricultural users.

The four types of uses recorded by the SCWA are expected to continue into the future, although the amounts of water sold for each type of use, and the relative proportions of such uses, may change.

Table D-1 following delineates the average daily water use per month from July, 1986 through June, 1987. These figures are the most current fiscal year total deliveries to the eight contractors.

Table D-1

AVERAGE DAILY WATER USE PER MONTH FROM JULY, 1986 TO JUNE, 1987
(figures in million gallons per day and acre feet)

Month & Year	(MGD)	(acre feet)
July, 1986	55.00	5066
August, 1986	49.00	4455
September, 1986	41.55	3734
October, 1986	38.02	3274
November, 1986	30.05	2727
December, 1986	40.16	3397
January, 1987	31.33	2766
February, 1987	30.91	2559
March, 1987	34.74	3149
April, 1987	43.07	4030
May, 1987	45.93	4404
June, 1987	57.66	5303

CONTRACTORS' WATER USE RECORDS

The following series of tables (D-2 through D-9) and Table D-10 delineate the individual contractor's historical (if available) and current water use plus information on period of record, type of record, source of record and water sources.

5. Description of frequency and magnitude of present supply deficiencies, including conditions of drought and emergency, and the ability of the supplier to meet short-term deficiencies*

FREQUENCY AND MAGNITUDE OF WATER SUPPLY DEFICIENCIES

SUPPLY DEFICIENCIES ON A REGULAR BASIS

Since 1959, when the Sonoma County Water Agency first commenced operation of its water transmission system, there have been no regular or frequent deficiencies of water supply to the Agency's water contractors. The only time that any type of deficiency occurred was during the 1976-77 drought, as discussed in the section below.

Table D-2a

CONTRACTOR'S WATER SOURCE RECORDS
City of Santa Rosa

Historical Water Use:

- Period of available records: Year 1979 to present.
- Water Use Records are: Annual
- Source of Records: Source Meter
- Water Sources:
    * Groundwater
      Current No. of active wells: Total wells = 9
      (2 are actively used during high demand periods, 7 are emergency standby only)
    * Purchased water (SCWA)

Table D-3a

CONTRACTOR'S WATER SOURCE RECORDS
North Marin County Water District

Historical Water Use:

- Period of available records: Year 1953 to present.
- Water Use Records are: Daily
- Source of Records: Source Meter
- Water Sources:
    * Surface water
    * Purchased water (SCWA)

Table D-2b

HISTORICAL AND CURRENT WATER USE
SANTA ROSA

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1974-75	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1979-80	14,781.0	N/A	N/A	N/A	N/A	N/A	N/A
1985-86	19,310	60	32	N/A	N/A	N/A	8

Table D-3b

HISTORICAL AND CURRENT WATER USE
NORTH MARIN WATER DISTRICT

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	5,605	N/A	N/A	N/A	N/A	N/A	6.4
1974-75	6,910	N/A	N/A	N/A	N/A	N/A	6.2
1979-80	7,549	N/A	N/A	N/A	N/A	N/A	8.0
1985-86	9,338	76.6	0	10.7	3.9	0.3	8.5

Table D-4a

CONTRACTOR'S WATER SOURCE RECORDS
City of Petaluma

Historical Water Use:

- Period of available records: Year 1953 to present.
- Water Use Records are: Daily
- Source of Records: Water Sales

  Source Meter
- Water Sources:
  * Groundwater

    Current No. of active wells - 11
  * Surface water
  * Purchased water (SCWA)

Table D-5a

CONTRACTOR'S WATER SOURCE RECORDS
Valley of the Moon Water District

Historical Water Use:

- Period of available records: Year 1969 to present
- Water Use Records are: Annual
- Source of Records: Water Sales
- Water Sources:
  * Groundwater

    Current No. of active wells - 1 (Standby only)
  * Purchased water (SCWA)

Table D-4b

HISTORICAL AND CURRENT WATER USE
PETALUMA

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	4,017	70	3	15	2	2	8
1974-75	5,326	70	3	15	2	2	8
1979-80	5,776	69	3	14	2	2	10
1985-86	7,298	70	3	15	2	2	8

Table D-5b

HISTORICAL AND CURRENT WATER USE
VALLEY OF THE MOON

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	1,532	67.17	N/A	23.77	N/A	N/A	9
1974-75	1,900	64	N/A	24	N/A	N/A	12
1979-80	1,891	71	N/A	18	N/A	N/A	11
1985-86	2,510	72	N/A	16	N/A	N/A	12

Table D-6a

CONTRACTOR'S WATER SOURCE RECORDS
City of Sonoma

Historical Water Use:

- Period of available records: Year 1972* to present.
- Water Use Records are: Monthly
- Source of Records: Water Sales
  Source Meter
- Water Sources:
  * Groundwater
    Current No. of active wells - 6
  * Purchased water (SCWA)

*Water sales records are probably available prior to 1972 but would take further research. Source meter data (except for minor use of city wells) would be available from SCWA.

Table D-7a

CONTRACTOR'S WATER SOURCE RECORDS
City of Rohnert Park

Historical Water Use:

- Period of available records: Year 1979 to present.
- Water Use Records are: Monthly
- Source of Records: Source Meter
- Water Sources:
  * Groundwater
    Current No. of wells - 21
  * Purchased water (SCWA)

ble D-6b

HISTORICAL AND CURRENT WATER USE
SONOMA

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	990**	N/A	N/A	N/A	N/A	N/A	N/A
1974-75	1,310	N/A	N/A	N/A	N/A	N/A	N/A
1979-80	1,336	N/A	N/A	N/A	N/A	N/A	N/A
1985-86	1,755	N/A	N/A	N/A	N/A	N/A	N/A

Table D-7b

HISTORICAL AND CURRENT WATER USE
ROHNERT PARK

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% % UNACCOUNTED
1969-70	1,123	N/A	N/A	N/A	N/A	N/A	N/A
1974-75	2,130	N/A	N/A	N/A	N/A	N/A	N/A
1979-80	4,051	N/A	N/A	N/A	N/A	N/A	N/A
1985-86	5,551	57	1	7	29	6	N/A

Table D-8a

CONTRACTOR'S WATER SOURCE RECORDS
Forestville County Water District

Historical Water Use:

- Period of available records: Year 1969 to present.
- Water Use Records are: Monthly
- Source of Records: Water Sales
  Source Meter
- Water Sources:
  * Purchased water (SCWA)

Table D-9a

CONTRACTOR'S WATER SOURCE RECORDS
City of Cotati

Historical Water Use:

- Period of available records: Year 1968 to present.
- Water Use Records are: Daily
- Source of Records: Water Sales
  Source Meter
- Water Sources
  * Groundwater
    Current No. of active wells - 3
  * Purchased water

Table D-8b

HISTORICAL AND CURRENT WATER USE
FORESTVILLE COUNTY WATER DISTRICT

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	165.27	50	.7	18	N/A	23	8.3
1974-75	226.03	50	.5	18	N/A	25	6.5
1979-80	277.01	58	.3	15	N/A	14	12.7
1985-86	411	59	.2	30	N/A	4	6.8

Table D-9b

HISTORICAL AND CURRENT WATER USE
COTATI

FISCAL YEAR	TOTAL WATER USE (acre feet)	% RESIDENTIAL	% INDUSTRIAL	% COMMERCIAL	% GOVERNMENT	% OTHER	% UNACCOUNTED
1969-70	188	N/A	N/A	N/A	N/A	N/A	N/A
1974-75	323	N/A	N/A	N/A	N/A	N/A	N/A
1979-80	370	80	3	5	3	2	7
1985-86	600	N/A	N/A	N/A	N/A	N/A	N/A

Table D-10

CURRENT USE OF WATER (ACRE-FEET)

Contractor	Russian River 1985-86	Wells/Other 1985-86	Total use 1985-86
Santa Rosa	18,920	390	19,310
North Marin	8,310	1,028	9,338
Petaluma	5,575	1,723	7,298
Valley of the Moon	2,503	7	2,510
Sonoma	1,755	0	1,755
Rohnert Park	791	4,760	5,551
Forestville	411	0	411
Cotati	11	490	501
TOTAL	38,276	8,398	46,674

SUPPLY DEFICIENCIES DURING DROUGHT PERIODS

At the time of the 1976-77 drought the Agency's contractors were relying upon Lake Mendocino for water supply. The Lake Sonoma project was under construction but being held up by a challenge to its Environmental Impact Statement and would not be completed for several years. Prior to 1976-77, the driest year of record was 1924. Each of those Agency contractors who had backup wells rehabilitated them and linked them to the overall system.

Additionally, as previously mentioned, the Agency drilled three deep wells along the Santa Rosa plains adjacent to Agency aqueducts for available groundwater to augment the Russian River supply. Several of the contractors augmented their supplies with groundwater by drilling new wells or refurbishing their inactive groundwater wells to further increase the available water supply.

During the second year of the drought, most of the contractors enacted emergency water shortage ordinances to reduce use of water through a phased program including prohibition of non-essential water use as defined, voluntary cutbacks of up to 40% and ultimately, in some cases, mandatory rationing.

The public response to these requests was extremely positive. Completion of Lake Sonoma in 1983 now allows the Agency and its contractors to successfully weather a longer drought period. The use of the term "drought" needs to be used judiciously since there is no guarantee that a drought could not last for many years and test even the best laid plans for combating a drought.

The Agency and its contractors have continued with an enhanced water conservation program since the drought years, as defined in other sections of this plan.

The State Department of Water Resources' publication "The Continuing California Drought," dated August, 1977 lists Sonoma County as one of the areas that appeared to be able to squeeze through the two-year drought by augmenting with groundwater. Had the drought continued, then other measures such as more widespread mandatory rationing would also have come into play.

Through January 1, 1991, the Agency can sustain a drought of longer duration than has historically occurred in the 1924 and 1976-77 droughts without any curtailment of water use.

6. Projection of future long range supply needs and plans, if any, for expanded or additional water supplies and facilities to meet those needs

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PROJECTED WATER USE

Water use for the years 2000 and 2010 were developed by DWR for use in the computer model runs carried out during the Agency's water rights hearings for Decision 1610. The water use projections were initially developed and documented in the "Water Action Plan for the Russian River Service Area" prepared by DWR in 1980. The projections were updated by DWR in 1985. The updated projections, which are generally higher, are presented below in Table D-11.

Table D-11

PROJECTED WATER USE BY SONOMA COUNTY WATER AGENCY
(acre-feet)

Month / Year	2000	2010
October	4420	5080
November	4010	4450
December	3520	3890
January	3520	3890
February	3520	3890
March	2450	2820
April	3450	3940
May	4420	5080
June	5890	6760
July	6380	7340
August	6380	7340
September	5400	6200
TOTAL	53,360	60,680

ADEQUACY OF EXISTING SUPPLIES

Extensive computer model runs carried out by DWR at the request of the SWRCB during the water rights hearings for Decision 1610 indicate that the present supply is adequate to meet the year 2010 demands without taking serious deficiencies, and that the 75,000 acre feet annual diversion limit would not be reached until closer to the year 2020. The model runs simulating the chosen alternative assumed a 30% reduction in municipal demand when storage in Lake Sonoma dropped below 100,000 acre-feet, which occurred in 2 of the 56 years modeled. This condition was also incorporated into the water rights permits,

and the 1976-77 drought experience demonstrates that these reductions are realistically achievable.

It is anticipated that when new sources are required, the conjunctive use of the groundwater basin underlying the area adjacent to the Agency's Cotati aqueduct for storage and withdrawal will be examined.

7. Degree of present water metering

All connections to the 8 water contractors' distribution systems, with the exception of single family residences in Rohnert Park, are metered.

(See following section on unaccounted-for water for Agency metering system)

8. Present water pricing structure of Agency

Costs per acre-foot of water delivered to the 8 prime water contractors are determined on April 30th of each year at a meeting of the Water Advisory Committee. Charges to contractors are determined by taking the total of costs associated with operation and maintenance of the system and capital costs associated with construction of facilities and dividing by the amount of water delivered in the previous 12 months. Costs per acre-foot in 1987 were from $218.52 to $242.52, depending on the point of delivery. A copy of the resolution adopting the rates is shown in Appendix 2.

In addition to the these charges, out of county contractors pay a Russian River Conservation charge to pay for the capital, operation and maintenance costs of the Warm Springs Dam Project. The charge, which in 1987 was $13.57 per acre-foot, is in lieu of the ad valorem taxes levied by the Agency on Sonoma County property owners to pay these same costs.

9. Water system pressures

Each of the Agency's aqueducts terminates at one of several storage reservoirs, which in turn supply most of the water contractors' customers at tank pressure. Since each of the lines is under pressure from an elevated reservoir at its terminal end, ample pressures are maintained at all times.

10. Present percentage of unaccounted-for water

(See Table E-1 and Table E-6 of section E, "Water Management Practices Analysis" for contractors' characteristics)

The Agency diverts water at its Wohler and Mirabel pump stations to 162 meter installations on its transmission lines, 76 of which serve the 8 prime water contractors and 86 of which serve minor users. The highest month of demand was experienced during July of 1987, when 5417 acre feet of water were sold to the 8 prime contractors. Meter records for this month indicate that slightly more (.08%) water was sold than diverted, reflecting an error in a venturi meter. Rockwell meters are currently being placed on each of the four collectors to provide more accurate pumping rate readings. In addition, the faulty venturi meter on the main line will be replaced in early 1988 by a new computerized meter, which will provide a redundant accounting of diversion rates. Meter records for the previous maximum month's demand, July of 1984, when 5177 acre feet of water were sold, showed a loss of 4.9%. Analysis of meter records from 1983 to 1987 indicate an average loss rate of 4.3%, which is believed to reflect metering errors. As the Agency has relatively few points of delivery in its transmission system, it is anticipated that all diverted water will be accounted for once the new metering system is in place.

E. Water management practices analysis

1. Water management practices analysis
Identification of water conservation measures currently adopted and being practiced including existing ordinances and codes.* Description of levels of effort, cost and effectiveness of each measure. Where possible effectiveness should be equated with estimated quantities of water saved.

CURRENT WATER CONSERVATION PROGRAM

HISTORY

This chapter summarizes the historical development of water conservation at the SCWA. In addition, SCWA's current water conservation program is described in detail (see Table E-1).

Water conservation in the SCWA's service area targeted efforts at developing and maintaining a long-term awareness of water and its efficient use. While the need for a Water Conservation Program was recognized by the WAC early on, the 1976-77 drought educated many citizens, particularly those in the coastal communities in southern Sonoma and Marin that we live in a region where water is, at times, a limited resource. The SCWA initiated a coordinated program in 1976 in an effort to optimize dwindling local water supplies.

Several actions were taken including the distribution of free water saving devices; a joint public information program, the development of voluntary rationing plans, water waste ordinances, and mandatory rationing and priority use programs. The SCWA itself experienced a 21% reduction in consumption. This was directly attributed to measures taken by the Agency to induce voluntary cutbacks County-wide. These measures included formation of a County-wide Drought Advisory Committee; distribution of free water-saving devices and brochures; declaration of an emergency by the Board of Supervisors; reduced releases from storage reservoirs; creation of a public awareness and education program through the media and coordinated by a private consultant; and the holding of numerous public meetings throughout the County directed toward both agricultural and urban consumers.

Table E-1

CURRENT WATER CONSERVATION PROGRAM

IMPLEMENTING WATER DISTRICTS

	City of Santa Rosa	City of Petaluma	North Marin County District	Valley of the Moon	City of Sonoma	City of Cotati	Forest-ville County District	City of Rohnert Park
Urban Water Conservation Methods:								
Education/Public Relations								
In-School Education	X	X	X	X	X	X	X	X
Public Speaking	X	X	X	X	X	X	X	X
Advertising	X	X	X	X	X	X	X	X
Demonstration Garden	X	X	X	X	X		-	-
Conservation Literature	X	X	X	X	X	X	X	X
Previous Usage on Water Bills	X		X	X		NA	X	-
Device Distribution	X	X	X	X	X	X	X	X
Water Management/Systems Improvement:								
System Water Audits	X	X	X			X	.	.
Leak Detection (Customer)		X	X		X		X	.
Leak Detection (Agency)	X	X	X	X			.	X
Meter Maintenance/Calibration	X	X	X	X	X	X	X	X
Valve Testing		X	X	X		X	NA	X
Meter Loan for Large Users			X				X	
Water Rate Structure	U	U	U	U	U	IB	QD	U&F
Regulations:								
Water Waste Ordinance		X	X		X	X	X	X
Low Flow Device Regulations	X	X	X	X	X	X	X	X
Water Emergency Plan			X	X		X	X	X
Meter New Construction	X	X	X	X	X		X	X
% Unaccounted Water	8.0%	8.0%	8.5%	11.0%	N/A	N/A	6.8%	N/A
Total Connections	27300	12339	15403	5803*	2760	1340	730	6407**
Total Water Used (A.F.)	19360	6468	9240	2484	1732	500	403	5350

KEY:

X = Program Exists
. = Program Considered for Future
- = No Program Planned
NA = Not Available

U = Uniform
IB = Increasing Block
DB = Decreasing Block
QD = Quantity Discount
F = Flat Rate

* 5457 Total Services
** Except single family residential to be unmetered

As the drought extended into its second year, some water contractors were forced to implement mandatory rationing programs designed to reduce consumption by 25 to 35 percent. The public responded with outstanding conservation performances, reducing water use even further than requested in almost every case. In North Marin's service area, customers were requested to voluntarily cut back 30% and responded with a 40% saving, in Santa Rosa a similar request resulted in 36% savings and other contractors achieved similar results.

The existing Water Action Plan (see Appendix 1) in the SCWA service area has recently been updated to optimize a vital resource - water - and to demonstrate compliance with State Water Resources Control Board recommendations for water rights permittees.

In recent years, the SCWA has increased efforts to encourage efficient use of water by customers. Since 1982, the SCWA contracted with a Water Conservation Coordinator to further implement and expand upon its Water Conservation Program. The SCWA has a broad range of water conservation measures in effect which include both supply and demand management.

Supply management measures are those actions the Agency takes to make the water supply system as efficient as possible. These efforts include leak detection and possible pressure reduction.

Demand management measures include programs designed to encourage customers to reduce their water usage either through education, which creates a conscience for water and its wise use, or by encouraging the use of water-saving technology and water-saving devices. SCWA's current water conservation program is summarized below.

SCWA's demand management measures are intended to create an awareness of water use and encourage customers to reduce their water usage. Demand management covers a wide range of efforts ranging from providing educational material for school children to establishing a water rate structure that encourages water conservation.

CONSUMER INFORMATION PROGRAM

1. Introduction

A public information program is needed to increase the public's awareness of water and the need to use water wisely. The SCWA's goal is to "continuously increase consumer awareness about the need for and benefits of water conservation."

There are two basic strategies for reaching the public. One is through a short-term, high profile approach designed to respond to a water supply crisis. The other technique is a long-term program which seeks to modify water usage patterns in gradual stages. Crisis-oriented programs often bear high percentage reductions in water use for a short while. Long-term public education efforts tend to produce gradual reductions that endure. In either case, water conservation programs must educate, persuade, even sell the idea that less is better.

2. Participants in Implementation

SCWA: Agency will continue to encourage the purchase and efficient use of the following water information activities.

1. Literature
2. Publications
3. Films/Slides
4. Exhibits and Information Centers
5. Speaker's Bureau
6. Advertising
7. News Releases
8. Tours
9. Committees
10. Xeriscape Video

Water Advisory Committee: The committee helps in the selection process of conservation materials and informs the Coordinator of special interest areas to be focused on.

Water Conservation Coordinator: The Coordinator is responsible for an inventory and review, ordering and making available the material, negotiating interagency agreement, the administering of cost sharing programs, and being fully accessible to the public for consumer information presentations and forums.

3. Schedule

Plan Review: An extensive public information search reviewing available Water Conservation literature and films was undertaken (see Appendix 3) at the launch of the public information program in 1982. Following this study of available information, the WAC Board reviewed the best materials selected by the Coordinator including bill stuffers, educational materials, handouts, slide shows, films, posters, stickers and other giveaways. The materials were selected to accomplish multiple goals, namely to reintroduce the public to the concept of water conservation as memories of the drought and the conservation practices which

resulted had begun to fade, and to replace this association of sacrifice with a positive image of residential water conservation.

The approach taken by the WAC to confront the resistance to water saving practices and ideas was to select a campaign focus with the message "year in, year out, please use water wisely." The slogan Save Water - Save Energy - Save Money clearly stated the theme that water is too valuable to waste at any time.

The focus on personal and community cost savings was reinforced with a subtheme "Be a Russian River Water Saver." The positive association of the Russian River--a landmark for vacationing families, riverside commercial interests, and local recreational users--was connected with the value of the local water supply.

The public education program in the SCWA service area utilized low cost, high yield techniques to elaborate the positive save-water theme. Bumper stickers, billboard posters, peel off stickers, and brochures were initiated with great success. Periodic press releases, television talk show appearances, and radio news spots also appeared in local media.

Ongoing Implementation: The public information activities described below are conducted by the SCWA as a continuing effort to encourage the efficient use of water. Each year the Coordinator and the WAC evaluate the existing practices, and adjust the practices to respond to new situations.

LITERATURE

- Existing Practices:

  SCWA currently distributes literature annually to its member agencies, schools, libraries, industries, other organizations and individuals. This literature is given free of charge.

  In addition, the Sonoma County Water Agency, in coordination with Marin Municipal Water District, recently co-produced a bumper sticker campaign for both Sonoma and Marin Counties.

- Water Saving Analysis:

  The exact potential for water savings is unknown, and depends on who receives and applies the information. Conservation literature promotes and encourages a conservation "ethic" of wise water use by describing specific practices which will save water.

- Implementation Feasibility:

  Literature dispersal can occur in many ways. For example, literature can be distributed in utility bills or through special mailings, at public speaking engagements, at locations throughout the community such as fairs, libraries, environmental organizations, offices, schools, water agency offices, displays, and to new customers.

PUBLICATIONS

- Existing Practices:

  The SCWA co-published with the Saratoga Horticultural Foundation and sells for a nominal fee the Success List of Water Conserving Plants. This publication has been embraced enthusiastically by the public.

- Water Saving Analysis:

  The potential water savings could be significant depending on the extent of the publication reception, the number of people reducing their water consumption as a result, and the longevity of the public's commitment to conserve.

- Implementation Feasibility:

  Conservation publications can be distributed by local water agencies. Displays are highly visible at the service counters or in information centers. Information about the publication can also be printed on bill stuffers and inserted in a special mailing campaign.

FILMS/SLIDES

- Existing Practices:

  The SCWA promotes water awareness through the use of visual aids to its member agencies, libraries, schools, civic organizations and private citizens free of charge. The films are also used successfully in the SCWA speaker's bureau program. In addition, fifteen films about water and water conservation were donated to the Sonoma County and Marin County Office of Education Audio Visual Libraries (see Appendix 3).

- Water Saving Analysis:

  The SCWA promotes the use of educational films primarily to bring about a water conservation awareness throughout its service area.

- Implementation Feasibility:

  Local efforts in the area of public presentations on water conservation are currently effective, but could be expanded. A brochure advertising films that have been purchased will be developed and distributed for future reference.

VIDEOTAPES

- Existing practices

  An eleven minute 1-inch edited master videotape showcasing xeriscape as the appropriate landscape for residential homeowners was produced in 1987. The videotape features aesthetically beautiful residential landscapes and explores in depth the seven fundamentals of a successful xeriscape.

- Water Savings Analysis

  As with publications, the potential water savings depends on the extent of circulation. Given the large proportion of residential water used outside, the savings could be very significant.

- Implementation Feasibility

  This videotape will be distributed freely to video rental stores, civic groups and organizations, landscape architects, designers and contractors.

- Project Costs

  The cost of the videotape was $15,000, which included script writing, production, actors, editing, and project manager time. Costs were shared between the SCWA and the North Marin Water District.

EXHIBITS AND INFORMATION CENTERS

The SCWA maintains approximately 30 exhibits which are used to display materials to encourage water awareness and conservation. The exhibits are located in high traffic areas such as the SCWA and local water supply agency lobbies, interpretive centers, local nurseries and any other locations

deemed appropriate. Water conservation literature is available at these displays, and the SCWA will continue to encourage the efficient use of water through such programs. In addition, the SCWA participates in local fairs, including the National Agriculture Day Fair, and the Sonoma County Fair. In 1987 the Agency constructed a captioned pictorial exhibit for the Sonoma County Fair showing some of the Agency's facilities as well as several water saving devices available for home use. The exhibit was highly successful and has been displayed at several other public buildings at the request of the Agency's water contractors and other interested agencies.

- Water Saving Analysis:

  It is possible to reach thousands of people relatively inexpensively through the use of exhibits in high pedestrian traffic volume areas. It is difficult to specifically isolate or monitor the effects such a program might have on the SCWA service area.

- Implementation Feasibility:

  The SCWA will continue to encourage the efficient use of water through such programs. The Agency's fair exhibit is available for display when requested, and other exhibits and centers are continually monitored and updated.

SPEAKER'S BUREAU

- Existing Practices:

  A speaker's bureau can be an important agency asset. All SCWA employees knowledgeable in his or her area assume full responsibility for presentations to schools, civic organizations, professional groups, etc. Requests for speakers are routed to the Coordinator. The Coordinator fills out a Speaker's Request form and routes it to the topic area contact person.

Audio visuals can help turn a good presentation into an excellent one. Ten thousand slides depicting the SCWA water delivery system and conservation topics are stored at the Water Agency office. To date, slide shows available are:

1. Water Conservation Plant Slide Show
   (North Marin Water District)

2. Making California's Water Work
   (Western Water Education Foundation)

3. Drought Tolerant Landscaping
(California Department of Water Resources)

4. History of California Xeriscapes
(SCWA)

. Water Saving Analysis:

If enough individuals are affected by information they receive through public presentations, and subsequently reduce their water consumption, there could be a significant reduction in urban water use.

ADVERTISING

. Existing Practices:

Since 1982, the SCWA has conducted an inclusive advertising program. This program has included both donated and paid television, radio, billboard, and newspaper advertising plus public service announcements, news releases and other activities designed to capture the public's attention. The Agency participates on a quarterly basis in televised talk shows featuring the SCWA's Assistant General Manager, Water Conservation Coordinator and Sonoma County's Public Information Officer, discussing such topics as the importance of water conservation and how water is used and managed. In addition, public service announcements are utilized extensively in local radio and television stations (see Appendix 4). Beginning in 1987, the Agency will begin participating in the annual California Water Awareness Week Program. The program will include the distribution of literature to 2700 area educators, conservation exhibits displayed weekly in public centers, open houses, advertising spots with local newspapers and radios, and a special television program on the Agency's water conservation program.

. Water Saving Analysis:

Advertising can be a very successful means to encourage water conservation. Purchased television time on major stations in the Bay Area is no small undertaking due to the high expense of saturating this market. In 1982, the members of the Bay Area Water Resources Council, which includes the Sonoma County Water Agency, joined together in inaugurating an annual radio and television campaign for the greater Bay Area and surrounding counties.

The cost of this Bay Area-wide campaign was $20,000 with this amount being divided among ten major utilities. A schedule on six major television channels during peak use times was secured for August, featuring two 30-second commercials. Each spot presented a forceful water conservation message. The spots, developed specifically for this campaign, were designed to attract audience attention, briefly present conservation methods, and end with a call to action--"save a gallon today." During the same month period, seven leading Bay Area radio stations played commercials with similarly worded water conservation messages. For an analysis of the results of this ad campaign, see Appendix 5.

NEWS RELEASES

- Existing Practices:

  The SCWA issues many news releases and features each year to more than 17 local newspapers and weeklies and bulletins.

- Water Saving Analysis:

  Potential water savings may result when the information is used to encourage conservation practices.

- Implementation Feasibility:

  The SCWA will continue to issue news releases and features specifically addressing water conservation.

TOURS

- Existing Practices:

  The SCWA offers tours of its facilities to interested groups, organizations, or individuals. All tours include discussions on water conservation.

- Water Saving Analysis:

  Potential water savings may result when the information is used to encourage conservation practices.

- Implementation Feasibility:

  Tours will continue to provide a forum for discussion of water systems and conservation and re-emphasize to the public that their local utilities are working in their best interest. Future directions would involve sponsorship of

one-day tours of the Agency's pumping plants, reservoirs and distribution system.

COMMITTEES

- Existing Practices:

  Committees increase the effectiveness and acceptance of local conservation programs in the community. Such committees generally consist of concerned citizens and representatives from school districts, city/county agencies, community organizations, and professional landscape associations. And finally, the SCWA's Water Advisory Committee is utilized for many different purposes. For example, the committee offers advice and aid in the development and implementation of the SCWA's school program. The committee also offers a quarterly forum where ideas and experiences can be shared by member agencies. The SCWA's Board of Directors and each of the Agency's committee meetings are also open to the public.

  In addition to this committee, a steering committee has been formed to design the third annual Northern California Xeriscape Conference to be hosted by the Agency and the North Marin Water District. The committee includes volunteer members from area-wide Northern California water industries, landscape contractors, and local retail and wholesale nurseries.

- Water Saving Analysis:

  Input at these meetings is directed toward reviewing and implementing existing or new water conservation methods.

- Implementation Feasibility:

  It is anticipated that the SCWA will form other committees from time to time as the need arises. The purpose of these committees would be to offer advice regarding specific water conservation programs or other functions deemed appropriate.

SCHOOL EDUCATION PROGRAM

Introduction

An in-school education program for elementary schools has been developed and maintained by the SCWA to encourage the efficient use of water and to achieve a greater water conservation awareness by the public. Maintenance includes additional water conservation curriculum materials and teacher

resource supplements to augment existing materials. This education program emphasizes regional and local water conditions, water conservation, and addresses the relationship between water and energy.

Participants in Implementation

a. School Districts:

School district boards, administrators and teachers were contacted to help develop the curriculum and administer the program.

b. Water Advisory Committee:

The committee, composed of the eight prime Water Contractors, shares the design and implementation of the program.

c. Water Conservation Coordinator:

Assists Water Advisory Committee and conducts the school education program.

2. Schedule

a. Existing Plan:

The in-school education program in the Sonoma County Water Agency service area reached 23,000 children and 2700 teachers in the 1986-87 school year. This program, which reached students in 63 schools, involved three stages: 1) coordination; 2) in-service training and material distribution; and 3) review.

b. Plan Review:

The SCWA works together with the County school offices through the Water Conservation Coordinator to create curriculum programs (including written material and software) for submittal to all local school districts. The Water Advisory Committee advises on the specific nature of such programs. A continuing curriculum program is completed, approved and ready to use by the start of each school year.

Table E-2

SUMMARY OF SCHOOL MATERIAL

Publication

Water Education Resource Guidebook

Captain Hydro

Water Fun

Water - Our Most Natural Resource

Water is Your Best Friend

The Story of Drinking Water

California Water Works and Why It Does

California State Water Compendium

Region 3- San Francisco Bay Area

California Water Resources Development Map

Hands on Water Activities - Gilbert Yee

c. Plan Presentation:

During local review of the plan, the County Superintendents of Sonoma County and Marin County schools were asked to coordinate the initial preparation of a county-wide water awareness curriculum program with all 43 local school districts (142 schools). Permission was obtained from the County Superintendents to present the program at the District Board meetings.

Once all district representatives were named, a material packet and letter were mailed out. This letter introduced the program to chosen district representatives unfamiliar with the program, and specified that a contact person from each school in the district be named. This established an effective "pyramid" approach to material distribution.

d. Implementation

During the in-service workshop, visual aids as well as contracted science education specialists, were used. The program, the need for conservation and the local and statewide

water supply situation were explained. Local environmental education centers were identified with an explanation of how to combine them with a water conservation activity.

e. Curriculum Materials:

Good curriculum materials on water conservation and water awareness are necessary for a successful water conservation education program. Prior to the initiation of the school program, an exhaustive review was completed of educational materials available statewide. An inventory of SCWA's education materials was also completed, and recommendations made to the WAC regarding changes or additions to existing stock and including materials for high school. A summary of the education materials introduced for the water awareness program is provided in the Water Education Resources Guidebook. In addition, curriculum materials were explained and samples distributed. Teachers' suggestions on incorporating water conservation activities into current lessons or studies taught in their classroom were also solicited.

f. Ongoing Implementation:

Annual review of school curriculum will be made to update and refine the SCWA's in-school education program. This review should be made by and should include school administration and personnel, the SCWA and the Water Conservation Coordinator.

The elementary school program will continue on a biannual basis with three to four grades targeted every year.

g. Promotion of the Program:

Radio, television and newspaper public service announcements concerning the water awareness program are made available to the public. A follow up is made including press releases, teacher training workshop dates, curriculum material distribution dates, school contests, local school statistics, anticipated number of students to be reached through the program, and general information about the program and the local water supply situation.

h. Speaker's Board:

In addition, the SCWA, upon request, furnishes speakers to any school within its service area free of charge. Topics discussed by speakers include the hydrologic cycle, sources of water for Northern California, methods and reasoning for reducing

water use, and general water-use information. Audio visuals are also used extensively throughout these presentations.

i. School Contests:

Water conservation contests get students, teachers and the community involved in the program. A recent poster coloring contest co-sponsored by the SCWA and National Agriculture Day resulted in three prize winners. The prizes were courtesy passes from a regional amusement park. Prizes, which make the contests authentic, might also include a trip to an outdoor environmental facility, or the transference of the poster artwork to postcards which all the community might enjoy buying and mailing.

j. Project A.I.M.S. (Activities for Integrating Math and Science)

This program is being co-sponsored by the SCWA, DWR, and the North Marin Water District, and consists of a two day workshop for forty kindergarten through 6th grade teachers.

j. Water Saving Analysis:

The success of a program in the schools is difficult to evaluate. The long-term impact of increasing student awareness of water and water use is less a cost/benefit question than an issue of better informed water customers in the future. The goodwill and expanded knowledge of tomorrow's water customers is a very valuable product resulting from such a program.

k. Cost:

The cost for this measure, which is shared among the eight contractors, involves purchase of the curriculum materials and software, teacher reference materials, and the time spent by the Water Conservation Coordinator to prepare and coordinate use of the materials in the schools. Materials are purchased in bulk quantities and donated by the Water Advisory Committee or Department of Water Resources, thus reducing costs to the Agency and school.

LANDSCAPE EDUCATION PROGRAM

Introduction

Outside water use accounts for about half of residential water consumption. Any public awareness or education program addressing itself to urban water conservation should include discussion of how to save water in designing and maintaining landscapes. Education of the general public, as well as

landscape professional (contractors, architects, landscape architects, maintenance personnel, planners) is needed on many topics. Landscape education would focus on drought tolerant plant materials, appropriate and efficient irrigation systems, and techniques for maintaining (irrigation, fertilization, etc.) the landscape.

Participants In Implementation

a. Landscape Professionals:

These professionals (including landscape architects, contractors, maintenance personnel, nursery people, irrigation suppliers-consultants, horticulturists, etc.) would work together to coordinate programs and create appropriate materials and training.

b. WAC:

Would work to encourage landscape programs.

c. Water Conservation Coordinator:

Would facilitate these programs, encourage landscape professional support, assist the WAC and schedule and advertise workshops.

WATER CONSERVING PLANT PROMOTION

Introduction

The purpose of a promotion campaign with nurseries is to encourage residential customers to consider planting drought tolerant plants in their garden. Local nurseries could stock native or water conserving plant, provide landscape water conservation literature and advertisements, tag individual water conserving plants for easy identification, and generally encourage customers to purchase them for their homes.

a. Pilot Program in North Marin Water District:

Throughout the fall of 1982, a pilot Water Conserving Plant Program was initiated in Novato. With the cooperation of the Saratoga Horticultural Foundation, and the participation of four local "full service" nurseries in the Novato area, North Marin Water District (NMWD) carried out two water conserving plant campaigns in the fall of of 1982 and spring of 1983 planting seasons.

The fall promotion centered around a "2-for-1" plant sale. NMWD direct mailed "2-for-1" coupons with water bills to all customers (at the time NMWD served 15,112 active connections, of which about 80% were residential customers, or 12,090 accounts). The "2-for-1" promotion was also advertised in local papers. Redemption of coupons took place at any of the four participating local nurseries mentioned on the coupon. NMWD supplied the participating nurseries with attractive wooden display stands featuring 17 pieces of literature about water conserving landscaping. The nurseries were also provided with bright orange tags to identify their water conserving plant stock; signs to designate the display area for these plants; posters, and popular tee-shirts screened with an orange poppy and outlined with a logo of the State and the wording "Water Conserving."

The program focused on the practical and educational aspects of the promotion. In a follow up analysis of the fall program, there had found been a coupon "penetration" of 5.6%, i.e., the number of customers who actually redeemed coupons. Nursery personnel estimated that the average customer seeking information picked up three handouts. In the two-month run of the fall promotion, 3,300 pieces of water conservation literature were picked up and information penetration was calculated at 8.3%.

The eight contracting water suppliers in the SCWA service area budgeted funds to participate in the educational component of the program in 1983. NMWD enhanced the plant promotion offer with a free one-gallon plant to any customer with a coupon. Coupons were mailed out with residential account billings once again in 1983. A local wholesaler of water conserving plants, Skylark Nursery in Santa Rosa, agreed to discount several varieties of plants and to deliver same to each nursery to use as the giveaway stock. The plants were placed by the nursery in a separate special display, and coupons were redeemed with Buck Fund monies (a private endowment in Marin County).

b. Water Saving Analysis:

The Spring promotion was quite successful. The program ran from April 25 through July 1. Penetration achieved was 13.5% for coupons redeemed and 5.1% for information picked up by consumers. Out-of-pocket costs to North Marin (including grant funded costs) were $6,340. Estimated benefits to consumers (based on a retail value of $4.00 for each one-gallon plant given away) was $7,100. Therefore, the B/C ratio for the Spring promotion was:

$$\$7,100/\$6,340 = \$1.12$$

c. Cost:

This program was funded in part by the San Francisco Foundation. Costs to North Marin (including grant funded costs) were $6,340.

d. Implementation Feasibility:

NMWD and SCWA will continue to promote the use of water conserving landscapes in the future. A campaign with nurseries should be part of a county-wide landscape education program. This measure would continue to be cost-effective for nurseries if a demand for drought tolerant plant exists, and to customers if they plant these materials in their gardens, thus reducing water use.

WATER CONSERVING PLANT PROMOTION - SPRING 1983

Existing Practices

Nurseries in the seven city and district service areas in Sonoma County were approached to become involved in a water conserving plant campaign modeled after the 1982 North Marin program. The target area included service areas for all water contractors.

Water Saving Analysis:

The strategy in the Spring 1983 promotion was to supply information, provide display stands, plant tags, directional signs, and tee-shirts with the poppy logo to the nursery staff and to sponsor an advertising campaign from April 25 through July 1. Included in the promotional efforts in the Spring were:

- Free media stories (newspaper and local radio)

- Paid newspaper ads

- SCWA radio commercial with a co-op paid schedule

- Posters placed in local businesses

With the enthusiastic enlistment of the initial four Novato nurseries, the Sonoma County participation and the involvement of two wholesale nurseries, the total number of nursery businesses involved was twenty-five. A barbecue at Skylark Wholesale Nursery near Santa Rosa was organized to provide a social and educational opportunity to familiarize nursery staff from throughout the target area with the program.

The promotional campaign with nurseries helped to educate many individuals as to the water use of various plants. If a widespread change occurs in individual attitudes towards low water use and low maintenance plants, then significant long-term reduction in urban water use would result.

Table E-3

WATER CONSERVING PLANT CAMPAIGN SUMMARY

SPRING 1983

1.	ADVERTISING	
	a. Local papers (some donated, some paid space)	$ 9,500.00
	b. Radio stations - 50/50 split on paid and donated airing time	2,500.00
		$12,000.00
2.	NURSERY PROMOTION*	
	a. Plant tags (5,000)	$ 2,000.00
	b. Printed tee-shirts for nursery staff	900.00
	c. Sign and information display stands	2,000.00
	d. Posters	900.00
		$ 5,800.00
3.	INFORMATIONAL HANDOUTS FOR DISPLAY STANDS	$10,200.00
4.	MEETINGS AND WORKSHOPS (conducted by Saratoga Horticulture Foundation or wholesale grower of water conserving plants)	1,000.00
5.	MISCELLANEOUS	1,000.00
		$30,000.00

* Based on 35 participating "Full Service" nurseries in Santa Rosa, Rohnert Park, Cotati, Petaluma, Sonoma Valley and Novato areas.

Implementation Feasibility

The spring campaign initiated future water reduction in the landscape programs. The SCWA and local water suppliers will continue to promote water conserving landscape programs to better serve and educate the SCWA service area customers.

TURF WATER MANAGEMENT SEMINARS

In 1987 the North Marin Water District, City of Santa Rosa, and SCWA each hosted an annual one day seminar on large turf area water management. The focus of the seminar is on the use of a lap top computer utilizing software which greatly simplifies the water audit process in determining irrigation needs. Leading turf management specialists are the featured speakers.

DEMONSTRATION GARDENS

Description:

Although water conserving landscaping clearly saves water and money, the general public (homeowners, professionals, etc.) and landscape professionals may not be aware of such landscaping aesthetic values. Individuals are more likely to consider having drought tolerant plants as part of their landscaping if they are aware of their beauty, lushness and variety.

At the entrance to the NMWD office, twenty-two water conserving plant varieties can be viewed by the public. Literature describing the plant material and a map of the garden is available. This garden was installed and completed in 1981.

Water Savings Analysis:

Water consumption in urban landscaping could be reduced substantially if many individuals begin to plant less water intensive gardens. Through educational efforts such as that of a demonstration garden, landscaping habits may change.

Cost:

The cost for this program includes the time for organization, and the cost of installing and maintaining the garden. Costs for NMWD included $1,620 for organization and office support; $600 for materials and labor and $450 for plant materials, totaling $2,670.

Implementation Feasibility:

The establishment of more demonstration gardens will depend on the willingness of local water agencies and individual property owners donating the demonstration garden for use in the program.

LANDSCAPE RESEARCH PROJECT - MULTIPLE FAMILY RESIDENCE

Description:

Water conserving landscapes can appear as lush and attractive, require less fertilizer, require much less labor to maintain, and require less water. Many native and Mediterranean plant species utilize much less water than plants commonly used for ornamental landscaping. Experience in California has indicated that homeowners will replace existing landscaping with drought tolerant landscaping only when there is limited water availability or intolerable water cost. There exist important conservation potentials in the education of landscape professionals in the use of alternative vegetation and in the encouragement of developers to consider drought tolerant themes, not only to reduce water but also to reduce maintenance costs.

a. Existing Practices - 1979-80

Data was collected for a one year period beginning in November 1979, on four townhouse projects, three of which were landscaped with a drought tolerant theme. All condominium projects are located in the dry coastal valleys of Marin and Sonoma Counties where annual rainfall is approximately 3 inches greater than the historic state average of 24 inches per year. Outside water use for irrigation purposes is separately metered on a bimonthly basis in all of the projects except one (Oak Forest - 43 dwelling units). For this project, inside water use was estimated at 54 gallons per capita per day and subtracted from meter readings. The apartment project (Silva Apartments) is partially served by a well for which the use has been estimated. All projects except the apartment project are maintained by hired professional landscape companies or personnel, none of which pay the water bills. All of the projects were built within the last decade and all could be described as middle to upper middle market housing.

Water use records were analyzed for the period November, 1979 through October, 1980. This period was selected as it basically encompassed a water year and coincided with bimonthly meter readings. Although rainfall during this period was 37 inches (compared to a local 25-year average of 27 inches), this year was

selected above others since it is the most removed year from the drought and because drought tolerant plantings were more mature.

From landscape plans for each of the projects, the areas landscaped with turf or non-turf (i.e., shrubs and groundcovers) was determined. Since the outside areas were owned in common and commercially maintained, few areas were landscaped solely with flowers, but where this did occur, these areas were included in the non-turf category. Turf versus non-turf areas were found to vary dramatically between the projects. Irrigation use was then added up for each of the projects for the selected 12-month period and a per-dwelling-unit value determined. The data is shown in Table E-4. Next, for the traditionally landscaped projects (Deerfield, Meadows-Hillside, Crossroads Village, and Silva Apartments), plots were made on irrigation use per dwelling unit versus turf, non-turf and total landscaped area per dwelling unit. Two plots were also made weighting the turf area by a factor of 3 and by a factor of 2.25. Of these, simply plotting total landscaped area per dwelling unit versus average irrigation water used per dwelling unit gave the best straight line correlation. This latter result, together with the data for the three drought tolerant theme projects, is shown in Figure E-1. Note the significant divergence for the three drought tolerant theme projects indicating support of substantially greater landscape for a given irrigation demand.

Table E-4

TRADITIONAL AND DROUGHT TOLERANT PROJECT COMPARISON DATA PER DWELLING UNIT

Condominium Project	Dwelling Units	Water Use	Turf Area	Non-Turf Area	Total Landscaped Area	Turf as % of Total
Deerfield	14	316	949	1358	2307	70%
Meadows-Hillside	174	217	1280	334	1614	79%
Crossroads Village	38	182	763	860	1623	47%
The Woods	148	143	1083	1229	2312	47%
Silva Apartments	30	113	464	578	1042	45%
Oak Forest	43	99	936	4548	5484	17%
Ignacio Creek	179	99	549	814	1363	40%

Projects with a drought tolerant landscape theme.

Gallons of irrigation water use/dwelling unit/day.

Includes well water contribution of 40%.

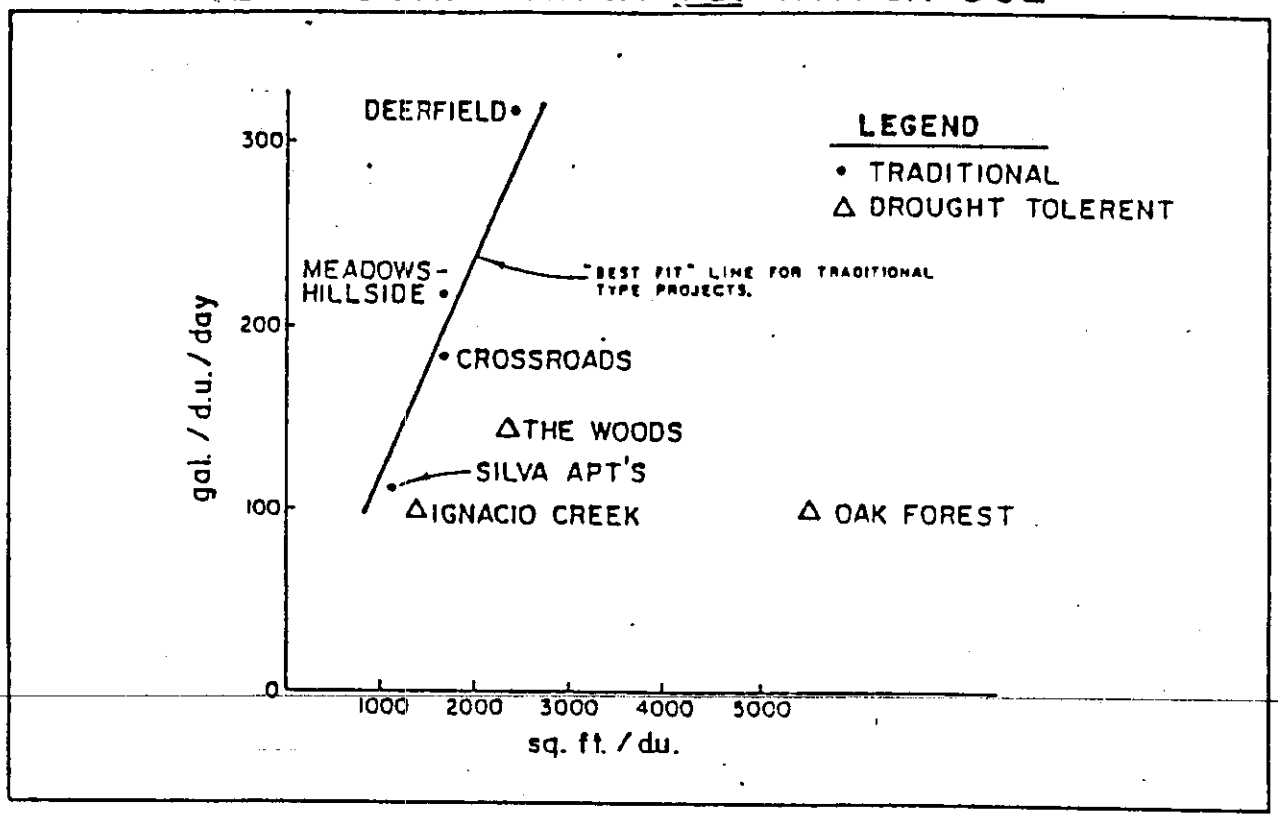
Actual metered use for this project included inside use and amounted to 190 gallons/dwelling unit/day. Fifty-four gallons/cap./day was subtracted from this value to arrive at outside use. Occupancy for this project was 1.7 persons per dwelling unit.

Square-feet of lawn per dwelling unit.

Square-feet of groundcover and shrub areas per dwelling unit.

FIGURE E-1

LANDSCAPE AREA Vs. WATER USE



Water Savings Analysis:

Irrigation water use compared between traditional and drought tolerant theme projects per square foot of total landscaped area is 47 gallons per square foot for the traditional projects and 18 gallons per square foot for the drought tolerant theme projects. It is noted that the latter value is skewed by the extremely large amount of non-turf (and hence lower water using landscape) in the Oak Forest project. If Oak Forest is deleted from this comparison, the resulting value for the remaining two projects (The Woods and Ignacio Creek) is 24 gallons per square foot of total landscaped area.

Implementation Feasibility:

The results of this research are judged extremely useful. For the first time, water managers, landscape architects, and others will have the hard data and cost information necessary to convince developers of the merits of utilizing water conserving landscapes. The data and results will also be valuable to state and local agencies who must plan for future water needs. Water utilities and other agencies will have information supportive of regulatory decisions which either encourage or outright require utilization of water conserving landscape designs and materials.

b. Current Practices - 1985-86

The object of this program is to compare the water, energy, materials and labor requirements of conventional landscaped multi-family developments with water conserving landscapes.

To establish base line information on traditionally landscaped projects, a group of four planned unit developments containing 256 dwelling units have been selected. Selection criteria required that: landscapes be mature and well maintained, water be served by public water utility, and that irrigation use be separately metered.

Water Saving Analysis:

Using the data available from the utility and area climatological stations, the following information will be compiled: profiles of applied water, applied water as percent of potential evapotranspiration, indirect and direct energy expenditures, labor expenditures, materials expenditures, relationship of applied water to appearance, and other relationships of interest. All traditionally landscaped projects will then be analyzed and relationships determined, such as the consumption of water per dwelling unit and overall maintenance costs per dwelling unit versus landscaped area (both turf and total landscaped area) per dwelling unit. Similar information for water conserving projects will be calculated and comparisons to the traditionally landscaped projects will be made and conclusions drawn.

Cost:

Table E-5

RESEARCH PROJECT COST ESTIMATE

ITEM	F.Y. 84-85	F.Y. 85-86	TOTAL
1. Payments to Landscape Maintenance contractors	$ 4,500	$ -	$ 4,500
2. Scope work, refine sample, set up forms, make contracts	1,720	-	1,720
3. Install irrigation meters (one project)	3,500	-	3,500
4. Install rain gages	900	-	900
5. Install evaporation pans	3,900	-	3,900
6. Field monitoring and data collection	4,320	4,040	8,360
7. Analysis of data	1,000	5,950	6,950
8. Write reports, photos and drafting	800	2,720	3,520
Totals	$20,640	$12,710	$33,350

Implementation Feasibility

The data and results are valuable to the community and state and local agencies who must plan for future water needs. As construction of multiple dwelling units in planned unit developments expand their dominance over the new housing market, the opportunity to implement attractive water conserving landscapes expands dramatically.

The cost data for the project were analyzed and presented in July 1986. The results of the analysis, which showed substantial savings when compared to traditionally landscaped units, are presented below:

Water savings (irrigation) 55%
Maintenance labor savings 25%
Fertilizer savings 61%
Herbicide savings 22%

CIMIS UPDATE

CIMIS (California Irrigation Management System) weather stations are located in Novato and Healdsburg, with one additional station to be installed in Santa Rosa in the near future. These weather stations are used to provide up to the minute information to be used in large turf area management situations, such as those covered in the Agency's seminars previously described. The CIMIS telephone modem is on line for use by any interested participant.

Costs:

Costs for purchase and installation of the stations are approximately $8000.

LEAK DETECTION/WATER AUDIT PROGRAM

Description:

The goal of a model leak detection program is to achieve water savings by "minimizing leakage from the distribution system." Leakage, or unaccounted-for water, includes distribution losses through leaks, unmetered water delivered through fire hydrants, and water used in flushing water mains or sewers. These losses can be significantly reduced by an effective leak detection/water audit program.

Participants in Implementation

a. Water Contractors:

Three of the Agency's Water Contractors are already in the Leak Detection Program. Others with a high percentage of unaccounted-for water (over 3 to 4%) would be encouraged to participate in a leak detection program.

b. Water Advisory Committee:

Will work with the SCWA and the DWR to establish the criteria for the installation of an effective program among the Water Contractors.

c. Water Conservation Coordinator:

Will facilitate negotiation of the needed interagency agreements, and participate in the sharing of equipment among participating agencies.

d. Department of Water Resources

In 1978 the voters authorized the Clean Water and Water Conservation Bond Law for funds to be disbursed under the administration of the State Water Resources Control Board (SWRCB). In 1981, the DWR received a portion of these funds to conduct a number of water conservation programs including a voluntary statewide program to reduce water system leakage. The objective of the Leak Detection Grant Program is to achieve water savings by reducing unauthorized losses in municipal water systems.

Action Plan to Continue Existing Program and Implement New Programs:

One of the largest sources of unaccounted-for water is undetected leaks. The leak detection policy varies from agency to agency in the SCWA service area, as does the age of the various water distribution systems. The percentage of water production lost to unaccounted-for sources was reported as follows for the most recent fiscal year:

Table E-6

WATER PRODUCTION LOST

City/District	% Unaccounted Water
Santa Rosa	8.0
Petaluma	8.0
Rohnert Park	NA
Cotati	NA
Sonoma	NA
Forestville CWD	6.8
North Marin WD	8.5
Valley of the Moon WD	11.0

Santa Rosa, the largest contractor, has by far the most elaborate leak detection program. Leak detection includes some sort of method for "listening" for the underground leaks. Santa Rosa employs a trained staff of two people to continually monitor the distribution system with handheld supersonic equipment. The cost estimated by the DWR for detecting leaks averages $225 per day for a two-person crew (1985 prices). This program, during the 1982 fiscal year, reduced leakage by 107 gallons per minute (gpm) with an estimated savings of 56.2 million gallons per year. Santa Rosa continues annually with its model leak detection and water audit programs.

The City of Petaluma and the NMWD initiated leak detection/water audit programs during this past year and information is not yet available in sufficient quantity to include in this plan.

Smaller districts, or districts without a current leak detection/water audit program respond "as notified" to leakage problems.

Leakage control can be viewed as a tool to improve the overall efficiency of the system. Technology exists today for detecting leaks at a fraction of a gallon per minute. With proper training operators can pinpoint leaks with great precision.

The following information is recorded of each investigation:

- part of the main damaged and cause of the damage;
- repairs made and inspector's recommendation;
- size and type of leak;
- type of soil, surrounding conditions and depth of cover;

Additionally, S.C.W.A. has had a very active valve-exercising and corrosion control program since the transmission system was first installed. There are currently approximately 12,000 magnesium-anodes installed.

WATER SAVING DEVICES AND FIXTURES

Home Retrofit of Plumbing Devices

Plumbing device retrofit is an effective means to reduce water consumption and has the added appeal of being relatively effortless. Once installed in the home, water saving devices can save thousands of gallons a year, and this savings is achieved without any conscious effort on the part of the customers.

Household (indoor) water use varies little with the season. Typical use factors can be estimated as:[1]

	Percent	Gallons per Capita per Day (GPCPD)
Toilet Flushing	45%	29
Bathing	30%	19
Laundry and Dishes	20%	13
Drinking and Cooking	5%	3
Totals	100%	64

1. John Olaf Nelson, North Marin's Little Compendium of Water Saving Ideas, 1977 edition, p.7.

As indicated, the greatest water use occurs in the bathroom. Over 75% of water pumped into the home is utilized for showers and toilets. The toilet, the largest water user, has not been designed to be water efficient in the past. The typical water closet prior to 1978 was designed to use 5-7 gallons per flush. A person using a 5-gallon flush toilet will contaminate about 13,000 gallons of potable water in a year to dispose of 165 gallons of body waste. Thus, retrofitting household fixtures can produce significant wastewater treatment savings from 2-4 gallons of water with each flush.

A typical water saving kit provides water displacement devices for the toilet, flow restrictors for the showers, dye tablets to check for toilet leaks and informational literature. Significant savings can accrue from shower flow restrictors since they limit the amount of hot water running down the drain. The typical shower uses 4 to 5 gallons per minute and this flow can be reduced to 2-1/2 to 3 gallons per minute with the installation of a flow reduction device.

The reinforcement of water savings resulting in personal money saving is another advantage. Retrofitting showers and toilets saves dollars, energy and water. Depending on local water and energy costs, a single household of four can save anywhere from $15.00 or more per year from retrofitting water-using fixtures.

Participants in Implementation

a. Department of Water Resources:

Under the Clean Water Grant Program, the DWR supplied the SCWA service area with free water saving kits in 1982, and for any subsequent years.

b. Water Advisory Committee:

The WAC decided to expand the kit distribution program to include the entire SCWA area to take advantage of economies of scale in collaborating on program advertising and to increase the commitment to local water conservation.

c. Water Conservation Coordinator:

Investigated water savings kit availability, maintained contact with kit supplier (the Office of Water Conservation), facilitated negotiation of the necessary kits, assisted the WAC in kit distribution and organized the kit survey in the Fall 1982, and continues to promote the home retrofit program.

Schedule

a. Plan Review:

The Office of Water Conservation (OWC) was formed in 1979 to serve the DWR in assisting organizations and individuals in water conservation programs. In the early 1980's, the OWC initiated several water saving kit distributions and was designated to coordinate kit programs funded under grant money by the SWRCB. Santa Rosa, Rohnert Park, and Cotati were contacted by the OWC staff because these cities were targeted by the SWRCB as "sewage treatment problem areas which would benefit most from the distribution of water saving kits."

In general, a kit distribution is worthwhile in an area with homes built prior to 1978, and where these older fixtures have not been retrofitted. Homes built since 1978 are required by California law to have low water using fixtures.

b. Initial Implementation:

Eventually the OWC/DWR was able to supplement the initial distribution with water saving kits for Petaluma and Sonoma as well as an over-the-counter supply of kits for Valley of the Moon and Forestville County Water Districts.

Table E-7

SONOMA COUNTY WATER AGENCY KIT DISTRIBUTION

Fall 1982

City	Number of Kits Distributed	
	By Mail	Over-the-Counter
Santa Rosa	26,972	2,000
Petaluma	11,500	3,000
Sonoma	2,500	1,000
Valley of the Moon	-	1,400
Forestville CWD	-	600
Cotati	1,400	-
Rohnert Park	10,160	1,840
Totals	52,532	10,340

c. Water Saving Analysis:

To calculate water savings from the kit distribution, the findings of a comprehensive research study conducted under the

sponsorship of the U.S. Department of Housing and Urban Development and based on experience in Los Angeles, the East San Francisco Bay, and the North Marin Water District were employed. This work indicates that for similar penetrations (i.e., actual kit utilization), overall average savings of 6.7 gallons per capita per day can be expected. Total population in the five participating agencies was 163,355. Therefore, overall savings were:

$$163{,}355 \times 6.7 \text{ GPCPD} \times 365 \text{ days} \times 3.07 \times 10^{-6} = 1{,}226 \text{ acre-feet/year}$$

The economic value of this saved water was taken as being equal to the current rate that retail water suppliers pay the SCWA for the operation and maintenance component for water delivered, namely $117/acre-foot or:

$$1{,}226 \text{ acre-feet/year} \times \$117.00 = \$143{,}442/\text{year}$$

In making this calculation, energy saved by heating hot water and water saved due to discovery and repair of toilet leaks has not been considered.

Table E-8

SCWA KIT DISTRIBUTION SURVEY

Fall 1982

1. Kits provided by DWR:

September	October	Total
44,722	19,150	63,872

2. SCWA Service Area:

Population	Residential Water Connections in Area of Kit Distribution
175,835	57,048

3. Mode of Distribution - Fall 1982:

City or District	Direct Mail[1]	Zip Code Mail[2]	Door to Door[3]	Counter
Santa Rosa	x			
Petaluma	x			
Sonoma				x
Valley of the Moon				x
Forestville CWD				x
Cotati			x	
Rohnert Park		x		

4. Number of Kits distributed by Modes 1, 2, and 3: 52,532
   Number of Kits distributed over-the-counter: 6,340
   Total Kits distributed: 57,532

   Kits Remaining: 6,340

1. Direct Mailing of kits to every water connection with kit labels derived from computerized billing printouts.
2. The post office agreed to carrier route sort and deliver the kits by zip code in the Rohnert Park Service Are.
3. The Boy Scouts in Cotati delivered the kits in a plastic bag door hanger to each home (including multiple unit housing).

Table E-9

HOUSING COMPOSITION IN AREA OF KIT DISTRIBUTION[1]

a. Average Dwelling Unit - Occupancy 2.7 persons per household
b. Percent of Housing Stock Type

City or District	Single Family	Apt. Units	Mobile Homes	Townhouse or Condos	Total-Dwelling Unit
Santa Rosa	56%	34%	-	10%	35,372
Petaluma	88%	6%	3%	3%	12,535
Sonoma	58%	18%	13%	11%	3,000
Valley of the Moon	80%	12%	-	8%	4,852
Forestville CWD	98%	2%	-	-	621
Cotati	59%	20%	-	21%	1,388
Rohnert Park	53%	19%	16%	12%	9,391
TOTAL					67,159

c. Growth - the Bay Area Association of Governments census data of 1980 projects a population increase of 46.8% by the year 2000 in Sonoma County. Currently, there are approximately 124,000 total housing units in Sonoma County and 135,000 land parcels. In a good economic year, about 24,000 total parcels turn over ownership (presently this rate is at approximately 16,000 parcels per year). As a result, the average parcel is held approximately seven years.

1. Based on information from Water Agency or Planning Department staffs in each city or district given in response to a survey in May, 1982.

Table E-10

TELEPHONE SURVEY RESULTS OF KIT DISTRIBUTION

How many customers acknowledged receiving a kit?	44%
Percentage of shower flow restrictors installed?	11%
Percentage of toilet displacement bags installed?	21%
Percentage of dye tablets used to check for leaks?	20%

Table E-11

INSTALLATION RATE OF KIT DISTRIBUTION

	Sonoma	Santa Rosa	Rohnert Park	Cotati	Petaluma
Total Number of Responses	100	200	200	100	217
% Acknowledged Kits Received	42%	34%	57%	43%	42%
Installed Shower Flow Restrictors	7%	12%	11%	13%	12%
Installed Toilet Displacement Bags	15%	15%	33%	19%	18%
Used Toilet Leak Detector Tabs	14%	13%	36%	23%	14%

Ten percent of the homes surveyed in the five cities that direct-mailed or door-to-door delivered water saving kits had respondents report pre-existing water saving devices were already in place. Both Forestville and North Marin Water Districts reported high levels of water saving devices still installed from distribution during the drought (1976-77). Because both Forestville County Water District (697 water connections) and Valley of the Moon County Water District (4,930 connections) had been particularly hard hit by reduced revenues during the wet winter and anticipated rising costs were predicted for these small districts, the agencies both distributed kits by request at the counter and supplied kits to new customers signing in for water accounts.

Almost each city or district service area that received water from the aqueduct system has experienced at least 2 kit distributions (during drought 1976-77 and in 1982).

d. Ongoing Implementation

The Coordinator would continue to support the distribution of retrofit kits. Approximately 400 kits were distributed at the National Agriculture Day Fair, Winter 1985, to Sonoma County school children. Increased conservation efforts in the city of Santa Rosa lead to the distribution of 9,000 kits. These kits were donated by the DWR and disbursed by the California Conservation Corps through several special coordination efforts by the City of Santa Rosa throughout the Spring of 1985. The SCWA Water Conservation Program still has over 6,000 kits that can be distributed upon request, over the counter, or to service groups or schools requesting them. In order to distribute kits to people who most desire them, bill stuffers containing business reply mail postcards should be distributed by SCWA contracting agencies desiring to participate in such a program, perhaps in alternating years.

e. Cost:

The State Office of Water Conservation agreed to pay the cost of manufacturing, sorting and delivering the kits while the local participants had to supply "in kind services" such as coordinating an advertising campaign to promote the kits. Kits were either mass mailed, distributed over the counter, or door to door. The out-of-pocket cost of conducting the kit distribution program, including the value of the kits which were donated by the State was:

1. Value of kits: 57,532 kits @ $.50 each = $28,766

2. Water Conservation Coordinator and WCC Com. Labor 300 hours @ $12/Avg. = 3,600

3. Distribution effort labor (donated) = 0

Total 32,366

Therefore, the B/C ratio for the kit distribution is estimated as:

$143,422/$32,366 = 4.4

METER MAINTENANCE AND CALIBRATION

An effective meter maintenance and calibration program may help to detect system water losses. Meter maintenance and calibration is an important aspect of water management and water conservation. Well maintained and accurate meters are necessary to keep accurate records of water deliveries and sales.

Participants in Implementation

a. Sonoma County Water Agency:

Would suggest regular schedule of meter maintenance and calibration, and would keep record of participating agencies.

b. Water Advisory Committee:

Would implement this program into each agency.

c. Water Conservation Coordinator:

Will assist WAC and local agencies in maintaining this program.

Schedule

a. Existing Practices:

During local review, the eight Water Contractors were asked to consider establishing a regular program of maintenance and calibration of meters in their system.

b. Initial Implementation:

The SCWA designed and implemented their own meter maintenance program. They took into account the increases of water costs as part of their program criteria. As the cost of water increases, the cost-effectiveness of meter replacement will increase. To account for the change in cost-effectiveness, the design of a meter maintenance program can consider different schedules of replacement for the different water pricing methods. This would enable water agencies to change their maintenance program as water prices change without re-evaluating the entire program.

LOW FLOW FIXTURES STATE LAW SUMMARY

California law requires a high standard of efficiency for plumbing fixtures. Flow limits have been set for showerheads, faucets, water closets and urinals. These laws conserve water and reduce consumption of energy needed to purify, pump and heat it.

Participants in Implementation

a. Department of Water Resources:

The DWR provided free of charge fifty (50) pamphlets entitled Water Conserving Plumbing Fixtures, April, 1984.

b. Department of Housing and Community Development - Division of Codes and Standards:

The DHCD provided free of charge fifty (50) SHL 84-1 information bulletins entitled Low Flush Water Closets, Urinals, and Flushometer Valves.

c. California Energy Commission:

The CEC provided free of charge fifty (50) Directory of Certified Showerheads and Faucets, August 1984, #P400-00-020.

d. Water Advisory Committee:

The WAC Board's decision to summarize and distribute California State laws to all wholesale and retail plumbing outlets, contractors, and interested parties was an increased commitment to local water conservation.

e. Water Conservation Coordinator:

Located desired materials and facilitated negotiation of materials, compiled materials into distributive packages and assisted WAC in county-wide distribution.

Schedule:

a. Plan Review:

During local review of the Plan, the WAC agreed to coordinate the preparation of a bound summary of specific low flow fixtures and devices approved by the State.

b. Initial Implementation:

During the initial phase of implementation, the Coordinator assessed and compiled the State laws into a one-page, easily understandable and accessible summary. This was used as a cover sheet and inserted along with the DWR pamphlet, DHCD bulletins, and the CEC directory into a binder. These binders were then distributed to appropriate parties, including plumbing retailers and wholesalers within the service areas. Additionally, the binders were distributed to each water contractor.

c. Ongoing Implementation:

The Coordinator, working in conjunction with the State Department of Water Resources, will semi-annually update the detailed list and distribute to appropriate parties.

d. Water Saving Analysis:

If the general public and developers were to make use of the available low-flow fixtures summary service, water consumption would be reduced in individual homes and in the county as a whole. Actual water savings would depend on the utilization of such low-flow fixtures.

APPENDICES

40-0-1
W.C. Plans + Programs
+
60-0-25
WAC

APPENDIX 1

1987 ACTION PLAN FOR WATER CONSERVATION IN THE SONOMA COUNTY WATER AGENCY SERVICE AREA

Participating Agencies (Water Contractors)[1]

Cities:	Santa Rosa, Petaluma, Sonoma, Rohnert Park and Cotati
Special Districts:	North Marin Water District, Valley of the Moon, and Forestville County Water Districts

INTRODUCTION

As a public agency providing a basic and vital service to the eight contracting communities, the Sonoma County Water Agency (SCWA) and (with the help of a full-time Water Conservation Specialist) the participating agencies have developed and are implementing a comprehensive water conservation program. In an effort to maintain a steady level of interest and commitment on the part of area residents to water conservation, several water program elements have been established and others proposed. Program elements address: low flow fixtures, water audit/leak detection, efficient water conserving landscapes for both new developments and existing developments, school program, public information and program implementation. The Water Advisory Committee (WAC), made up of representatives of the Water Contractors, develops program elements and makes recommendations for funding and implementation to the Sonoma County Water Agency and the participating city councils and district boards.

PROPOSED PROGRAM ELEMENTS

1. Low Flow Device Compliance - $1,000

Goal: "See that all new development is equipped with state-of-the-art water conservation devices."

Recap of Prior Activity

The State of California has directed that water conservation be handled by local water distributors whether they be private or public agencies. State legislative support for water conservation exists in the standard of "reasonable and beneficial use" set in the California Constitution. Within the past decade, California Law regarding conservation methods has become much more explicit.

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1. Cities and Districts which purchase water from the Sonoma County Water Agency.

In 1976, the North Marin Water District was instrumental in getting a state law passed requiring use of low flush (3-1/2 gallon/flush) toilets in all new residential developments. In 1978, low flow shower heads (2.75 gallon/minute) were also mandated by California Law. In 1983, flow controls for all lavatory faucets and sink faucets were also limited to 2.75 gallon/minimum. Flush volume standards for flushometer valves commonly used in public restrooms on urinals and toilets were limited to 1.5 gallon/flush in legislation passed in 1983. The labeling of water (and energy) efficiency of dishwashers and washing machines has been investigated and may be required by state legislature in the future. Tax inducements have also been initiated by the state. In July 1980, legislation was signed that created a tax credit of 55% for new water conservation fixtures (including irrigation equipment and cistern systems) installed through January 1, 1983. These credits were not extended except for credits for water efficient irrigation equipment, which remained effective until 1985. Within 1985, all state laws were compiled into an easily understandable summary and distributed to all Water Contractors and all wholesale and retail plumbing outlets. The Water Contractors recognize the value of encouraging compliance with state law as well as the desirability of maintaining consistency between local regulations and the rapidly evolving state law.

1987 Plan

A penetration survey of installation and compliance with state law would be circulated to all Contractors. The Agency would compile the results of the survey and report to the WAC with recommendations regarding a self-reporting or inspection program if found necessary. In addition, Scwa would work with other agencies in support of California Law and administrative code changes that will increase level of compliance by manufacturers of water saving devices. Workbooks will continue to be updated and made available to plumbing outlets.

Future Directions

A. Look for pilot program opportunities to demonstrate how to upgrade and achieve greater penetration of "quality" low flow shower head devices.

B. Develop and implement a comprehensive toilet leak detection program. This might best be initiated on a pilot basis in one of the Water Contractor service areas. Review results, and if cost-effective, implement throughout the entire SCWA service area.

C. Review information available in the literature on the water conservation effectiveness of various household appliances (dishwasher, clothes washers, etc.) and consider distribution of this information to appliance retailers in the water service area.

2. Water Audit/Leak Activity

Goal: "To minimize leakage and loss of water from distribution system."

Recap of Prior Activity

Santa Rosa, the largest Water Contractor, has implemented a very comprehensive leak detection program which has gained statewide recognition. Santa Rosa has a trained staff of two people who continually monitor the distribution system with supersonic equipment. This program, during the fiscal year 1982, reduced leakage by 107 gpm with an estimated savings of 56.2 million gallons per year. Also, in a study of statewide leak detection, the City of Petaluma was chosen for a leak detection demonstration. The Boyle Engineering firm was hired to analyze the few existing leak detection programs. The Boyle study concluded that leak detection programs were generally cost-effective, should be greatly expanded, and would reduce water production and treatment costs, and the marginal costs related to construction of new facilities. The state subsequently offered grants to public water utilities interested in undertaking leak detection programs. During 1985, the North Marin Water District and the City of Petaluma undertook and implemented comprehensive water audit and leak detection programs. Santa Rosa continued its model leak detection program.

1987 Plan

The SCWA will continue to work with the City of Santa Rosa, City of Petaluma and the North Marin Water District on their leak detection programs. A status report shall be prepared and circulated to all Water Contractors together with information on costs and benefits.

Future Directions

Review effectiveness of leak detection programs undertaken by Water Contractors and statewide, and consider expansion of program to Water Contractors.

3. Efficient Landscape - New Development $53,656.00

Goal: "Decrease use of turf and increase use of water conserving plant materials and efficient irrigation systems in new developments".

Recap of Prior Activity

North Marin Water District has been active in promoting water conserving landscapes in new developments. The District's Regulation 15 offers a $150.00/dwelling unit incentive to developers who install landscapes that meet Xeriscape design criteria - particularly limiting turf areas. The program has been well received by planned unit and apartment project developers, but is

not reaching individual single family detached homeowners. The 1987 Plan is aimed at finding a strategy to remedy this problem.

1987 Plan

The SCWA and NMWD currently are developing and promoting an eleven minute 1" edited master videotape on Xeriscape. The objective is to develop a landscape video targeted at homeowners about to landscape or re-landscape their property. The video promotes those landscaping techniques which result in a functional, aesthetic and water efficient landscape. Main concepts will include limiting turf area, landscape design, use of appropriate plant material and efficient irrigation systems and practices.

The distribution of the Xeriscape videotape will be to the following targeted areas:

* Distribution of six videos each to nursery and garden centers (including those located within and part of a hardware store or other large retail sales complex) with encouragement that the store owner set up a video display unit.

* Stocking each video rental store with a half dozen tapes each which would be made available free to patrons on the normal one-day check out system employed by the stores. Use (penetration) of the tapes would be enhanced by a bill stuffer informing customers of the availability of these tapes at their local video stores for free home viewing; and in the case of NMWD, information on the incentive program.

* Use of tapes in presentations to groups and organizations.

* Distribution of tapes to the local schools for use by educators in video presentations to their classes.

* Distribution of tapes to landscape architects and designers, contractors, irrigation system designers/installers for use in making client presentations.

* Distribution for sale of videotape to water utilities. A copy of the videotape would sell for $20.00 per copy, or, the utility can arrange purchase of a second generation master copy at a sliding scale price.

In addition to the videotape, the SCWA would print and distribute to contractors and new homeowners an illustrated pamphlet containing model water conserving landscapes, a localized plant list, and an efficient irrigation system design for typical single family detached homes. This pamphlet would also be used for distribution to customers considering relandscaping all or a portion of their property.

Future Directions

A. Host the 3rd annual North Bay Xeriscape Conference in the fall of 1988 targeted at landscape architects and designers, landscape contractors, planners, nursery industry, water industry housing developers, and homeowners.

B. Host a water conservation workshop for local city and county planners, design review boards and contractors.

C. Identify incentives to encourage use of water conserving landscapes in new development.

4. Efficient Landscapes - Existing Development - $1,000

Goal: "Promote conversion to water conserving landscape as customers upgrade or change their existing landscapes".

Recap of Prior Activity

In the fall of 1982, a Water Conserving Plant Promotion was piloted in Novato which had the goal of broadening the customers' understanding of the landscape and how it could be managed, altered or designed to use less water. Part of this program involved giveaway plant offers, information centers located in local area nurseries, and media advertising.

In the spring of 1983, the program was expanded to include all nurseries in the SCWA service area.

In preparing the AB797 Plan, possibilities of increasing consumer awareness of water conserving landscape options were explored.

All nursery information were reviewed and restocked with available materials.

1987 Plan

The landscape education materials will be inventoried and reordered as an ongoing program. The Agency will also review and restock with materials all nursery information centers. A proposed program is the free water conserving seed promotion. The Agency will prepare, print and distribute seed packets to contractors.

Future Directions

A. Continue to explore incentives to encourage use of water conserving landscapes in existing developments, with special attention to turf and area.

B. Consider the cost-effectiveness of providing free to customers, professional landscape designs which accomplish conversion of water loving landscapes to water conserving landscapes.

C. Review information on drip irrigation and, if appropriate, consider irrigation seminars and lectures targeted at audiences of managers, maintenance personnel and customers, with the aim in increasing familiarity and utilization of same.

5. School Program - $3870.00

The In-School Educational Program featuring teachers' guides and curriculum material specially prepared for grades K-6 was launched throughout the SCWA water service area in 1982. This program has been continued annually and in 1986 a Teachers Resource Guidebook was developed and printed. Approximately 2700 Guidebooks are sent to K-6 grade educators annually. As of June 1986, approximately 16,500 educational materials have been used by SCWA and NMWD service educators.

1987 Plan

This program will be ongoing at the elementary level, targeting grades K-6.

The Department of Water Resources, the Sonoma County Water Agency and the AIMES Education Foundation (Activities for Integrating Math and Sciences) will cooperate in a joint effort to produce and disseminate instructional materials dealing with water for use in grades K-9. The materials will be bought by the SCWA and distributed freely to any educator that attends this workshop. The workshop is scheduled for June 20-21, 1988, and will be one full day of Project AIMES and hands-on science projects. The following day will be devoted to tours of SCWA watershed area and exhibits.

Future Directions

A. Expand media coverage and explore greater use of free public service announcements and co-op ad campaigns.

B. Promote tours of Water Agency facilities.

6. Public Education - $7350.00

Goal: "To continuously increase consumer awareness about the need for and benefits of water conservation".

Recap of Prior Activity

The approach taken by the WAC to confront the resistance to new water saving practices and ideas is to formulate a residential water conservation program that seeks to advance the consumer from a vague awareness of the water supply situation to a high-level of motivation to conserve. A public information program was launched in 1982 with the primary focus being a School Educational Program. Bill stuffers, brochures, informational handouts, news stories, radio time, television spots, co-op advertising, posters, decals, bumper stickers, billboards, etc., have all been utilized. The School Education Program has been continued annually.

1987 Plan

Two beautiful water conservation exhibits (one stationary and one mobile) have been designed and constructed. The stationary exhibit is housed permanently at the Operations/Maintenance Center while the mobile exhibit is set up at water utility offices, city halls, shopping malls, libraries, etc., and has a semi-permanent home at Warm Springs Dam Visitors Center. A very successful booth was set up at the Sonoma County Fair, and many favorable comments were received about the mobile exhibit.

The SCWA promoted Water Awareness Week, October 19-24, throughout the service area. A one-half-hour television talk program was produced and aired featuring water conservation, as well as a one-half-hour radio talk show. Proclamations were submitted to local newspapers, and public service announcements were broadcast over the radio.

In addition to the exhibits, a 45-minute color slide program on the History of California Xeriscape Design has been developed and is shown regularly at clubs, conferences and organizations.

Future Directions

The Agency will continue to develop public service announcements (PSA's), news releases and would develop or obtain brochures, bill inserts, handbooks and stickers to provide comprehensive water conservation awareness on all aspects of water usage.

7. Coordination Committee - $1,000

The Agency proposes to establish a water conservation subcommittee and establish set meetings to help guide details of the program and coordinate implementation at the contractor level.

8. Ordinances, Regulations, and Service Agreement Provisions - No charge

Goal: "Regularly update ordinances, regulations, and service agreement provisions implementing water conservation or discouraging wasteful use of water".

Recap of Prior Activity

The SCWA prepared the Urban Water Management Plan. The Plan, relating to water conservation was required by the passage of Assembly Bill 797 and was submitted for public hearing on January 22, 1986. The Plan was approved and was then submitted to the State of California, Department of Water Resources, Office of Water Conservation. The requirements for submittal are only those water suppliers who provide water to more than 3,000 customers or supply more than 3,000 acre-feet of water annually are required to prepare such a plan. At the request of the Agency's eight Water Contractors, the Plan was prepared to cover the SCWA and all eight Water Contractors even though some of the Contractors were not required to prepare a Plan under Assembly Bill 797.

1986 Plan

As more information develops on effectiveness of water conserving landscapes and water conserving plant materials, consider amending regulations to encourage and require more efficient landscapes in new developments.

Future Directions

Formulate and adopt (Water Contractors) a uniform Model Water Conservation Regulation.

jg/ad.87actionpln

THE WITHIN INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE.

ATTEST: APR 2 1 1987
[illegible] Clerk of the Board of Directors of the SONOMA COUNTY WATER AGENCY
By: [signature] Deputy Clerk

APPENDIX 2

Resolution No. 87-0666

County Administration Building
Santa Rosa, California

DATE: April 21, 1987

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SONOMA COUNTY WATER AGENCY ESTABLISHING RATES FOR SALE OF WATER FROM AGENCY'S WATER TRANSMISSION SYSTEM FOR FISCAL YEAR 1987-88.

BE IT RESOLVED by the Board of Directors of the Sonoma County Water Agency that the following rates be and they are hereby established as rates for purchase of water from the Sonoma County Water Agency's water transmission system for water delivered during Fiscal Year 1987-88.

CHARGES PER ACRE FOOT FOR WATER USED FOR MUNICIPAL PURPOSES BY WATER CONTRACTORS*

	Santa Rosa Aqueduct	Petaluma Aqueduct	Forestville Aqueduct	Sonoma Aqueduct
perations & Maintenance Charge	$118.72	$118.72	$118.72	$118.72
eneral Obligation Bonds	7.91	8.07	24.48	15.64
Revenue Bonds				
Pipeline	16.28	39.80	6.88	24.07
Pumping & Storage	39.69	39.69	39.69	39.69
982 Revenue Bonds				
Pumping & Storage	36.24	36.24	36.24	36.24
TOTAL	218.84	242.52	226.01	234.36

Water Contractors are the Cities of Cotati, Petaluma, Rohnert Park, Santa Rosa and Sonoma, and Forestville, North Marin and Valley of the Moon Water Districts. Exceptions are (1) the North Marin Water District ($126.79) which issued bonds to finance their own storage facilities and therefore do not contribute to debt service costs for Agency storage facilities and (2), the City of Cotati ($260.52) which pays an additional $18.00 per acre foot in accordance with the terms of a prior agreement.

WATER CHARGES TO OTHER THAN WATER CONTRACTORS

Monthly Meter Charge

1" meter or smaller	$ 4.00
1-1/2" meter	5.00
2" meter	6.00
3" meter	7.50
4" meter	9.00
6" meter	10.00
8" meter	11.00
10" meter	16.00
12" meter	19.00

APPENDIX 3

AVAILABLE WATER CONSERVATION LITERATURE & FILMS

LITERATURE

1. Books, Pamphlets and Publications on Water Conservation
   State of California - The Resources Agency
   Department of Water Resources
   Office of Water Conservation

2. Browning of the Greensward
   Russell A. Beatty, Pacific Horticulture, Fall 1977

3. Catalog of Water Conservation Information
   California Office of Water Conservation, Department of Water Resources

4. Common Misconceptions About the California Drought Tolerant Landscape
   California Department of Water Resources

5. Drip-Drop-Drought, Suggested Procedures For Checking Summer Pressure Drops

6. Drip, Its Time Has Come
   Sunset Magazine, 1981

7. Drought Tolerant Landscaping . . . Way of the Future
   John Olaf Nelson, General Manager, North Marin Water District, 1980

8. The Dry Garden
   San Diego Home/Garden

9. Erosion Control on Bare Slopes
   University of California Division of Ag. Sciences #21137, 1979

10. For Summer-Dry California - Water Saving Planting Ideas
    Sunset Magazine, 1976

11. 40 Ways to Save Water in Your Yard and Garden
    L. K. Smith, Landscape Architect ASLA, 1977

12. Guide to Planting and Establishing Water Conserving Plants
    Saratoga Horticultural Foundation

13. Home and Garden Information Service
    University of California Cooperation Extension, Sonoma County

14. How to Have a Green Garden in a Dry State
    Metropolitan Water District of Southern California

15. How to Protect Your Home if Brushfire Threatens
Novato Fire Protection District

16. How to Save Water in the Landscape
Sonoma County Water Agency, 1982

17. How to Use Water Saving Devices Installation Information

18. Know Your Turfgrass, Turfgrass Selection Series
Division of Agriculture Sciences, Leaflet #2585
University of California, 1980

19. Landscapes for Fire Protection
University of California Division of Ag. Sciences #2401

20. Lawn Care/Bulletin 16
O. M. Scott & Sons Company, Lawn Care Magazine, 1982

21. Learn to Read Your Water Meter

22. Plants for a California Landscape
Mailer

23. Save Water, Save Energy, Save Money
Brochures, bumper stickers, and stickers
Sonoma County Water Agency, 1983

24. Saving Water In Landscape Irrigation
University of California Division of Ag. Sciences #2976, 1977

25. Selected California Native Plants with Commercial Sources
Saratoga Horticultural Foundation, 3rd Edition, 1981

26. Success List of Water Conserving Plants
Saratoga Horticulture Foundation, 1983

27. Success with Annual Flowers
O. M. Scott & Sons Company, Lawn Care Magazine, 1981

28. Success with Growing Vegetables
Ibid., 1981

29. Success with Trees and Shrubs
Ibid., 1981

30. To Our Patrons
Restaurant Information
Sonoma County Water Agency

31. Water Conservation Checklist

32. Water Facts

Sonoma County Water Agency

33. Water Short Gardening
Sunset Magazine Reprint

34. Water - Our Natural Resource
Channing L. Bete, Co.

35. The Story of Drinking Water
American Water Works Association

36. Wastewater Conservation
Emergency Notice
City of Santa Rosa, California, 1985

FILMS CURRENTLY AVAILABLE

All films available in either (or both) Sonoma County and Marin County, Office of Education Audiovisual Libraries

	Title	Grade Levels
1.	California: Geography-Weather-Water	K-6
2.	Learning About Water	K-3
3.	Resources	K-6
4.	The River Must Live	9-12
5.	Still Waters	4-12
6.	Stream Environment	K-3
7.	Water and What It Does	K-6
8.	Water Cycle	4-8
9.	The Water Says	K-6
10.	Water: The Common Necessity	K-12
11.	Wise Masters of Wind and Water	4-12
12.	Without Water What would happen if water suddenly disappeared	4-Adult
13.	Gardening California Style How to have a beautiful garden and save water too	5-Adult
14.	Water California Style History of California's water development: a look into the past and future	5-10

15. The California Drought — 8-Adult
What happened in 1976-77 and why

16. What Do You Know About H2O? — K-6
California Dept. of Water Resources Series:
Water for Farming
City
The Water Cycle
Save Water
Clean Water
Water for Industry

17. Water Follies (Animation for all ages)
Cartoon characters to the sound of music (no speaking) demonstrate some abuses and good uses of water.

18. Guzzler Gang — K-6
Animated film on loan from Metropolitan Water Dept. of L. A. featuring some infamous water wasters

19. Conservation of Mass: An Inquiry — 4-12

20. Conservation of Natural Resources — 4-12

21. Conserving Our Natural Resources — 4-8

22. Drop of Water — 5-12

23. Life in a Drop of Water — 4-12

24. Problem With Water Is People, The — 4-12

25. Rivers — K-3

26. Rivers of the Pacific Slope — 4-12

27. River Valley, The — 4-8

28. River - Where Do You Come From — 4-8

29. Water — K-12

30. Water Coming and Going — 4-8

31. Water for the Community — 3-8

32. Water, Fountain of Life — 4-12

33. Water, Lifeblood of the West — 4-12

34. Water, Water Everywhere - Observing Things About Us — 1-3

35. The Water Movie — 3-Adult

36.	The Water Planet	7-12
37.	Water in the Air	4-6
38.	Water in the Weather	4-8
39.	The Work of Rivers	4-Adult

UNREVIEWED FILMS

40. Time for conservation (DWP Electricity and Water)
41. Affluent, Effluent - New Choices in Wastewater Treatment
42. One, Two, Three . . . Clean
43. The 1st Pollution
44. Brush Creek Bounces Back
45. Renaissance of a River
46. River Watchers
47. 20th Century River
48. The Alternative is Conservation — 11-Adult
49. You Never Miss the Water — 10-Adult
50. The Miracle of Water**
51. People and Water**
52. My Toilet Keeps Running**
53. Wasting Not**
54. My World Water**
55. Delta Country**

** San Diego Water Authority Member Agency of the Metropolitan Water District of Southern California (MWD)

APPENDIX 4

PUBLIC SERVICE ANNOUNCEMENTS

JANUARY: 30-SECOND

START THE YEAR OUT SAVING! WATER CONSERVATION MEANS LESS NEED FOR EXPENSIVE NEW RESERVOIRS AND WATER/SEWER FACILITIES, WHICH THE ENTIRE COMMUNITY PAYS FOR. THE SCWA AND YOUR LOCAL WATER SUPPLIER ENCOURAGES YOU TO SAVE WATER, SAVE ENERGY, SAVE MONEY!

FEBRUARY: 30-SECOND

COLD WEATHER CAN BE HARD ON SHRUBS AND TREES. DON'T FORGET TO WATER THEM DURING PERIODS OF DRY, COLD WEATHER. AND PLEASE REMEMBER, DON'T WATER THE ROAD, SIDEWALKS OR GUTTERS; THEY WON'T GROW A THING! A COURTESY REMINDER BROUGHT TO YOU BY THE SCWA AND YOUR LOCAL WATER SUPPLIERS.

MARCH: 30-SECOND

WHEN PLANNING TO PLANT TREES, SHRUBS OR LAWN, WHY NOT CHECK OUT SOME LUSH, GREEN WATER CONSERVING TYPES? VISIT THE SCWA OR YOUR LOCAL WATER SUPPLIER FOR MORE INFORMATION ON LOW WATER USE PLANTS AND START SAVING WATER, ENERGY AND MONEY!

APRIL: 30-SECOND

WHILE PREPARING YOUR LAWN AND GARDEN FOR THE SPRING AND SUMMER MONTHS, BE SURE TO CHECK YOUR FAUCETS AND GARDEN HOSES FOR LEAKS. EVEN THE SLOWEST DRIP WASTES 20 GALLONS A DAY AND YOU PAY FOR EVERY DROP! FOR A COMPLETE LIST OF WATER SAVING TIPS, CALL OR DROP BY THE SCWA OR YOUR LOCAL WATER SUPPLIERS.

MAY: 30-SECOND

DID YOU KNOW THAT OUTSIDE WATER USE AVERAGES 44% OF TOTAL HOMEOWNER USE? KEEP SOIL MOISTURE FROM ESCAPING BY CREATING A BARRIER BETWEEN THE MOIST SOIL AND THE DRY AIR. INSTEAD OF BAGGING YOUR GRASS CLIPPINGS, LEAVE THEM ON THE LAWN TO PROVIDE A MULCH. THIS MULCH REDUCES THE AMOUNT OF WATER NEEDED FOR THE LAWN, AND ADDS NUTRIENTS TO THE SOIL. FOR A COMPLETE LIST OF WATER-SAVING TIPS, CALL OR DROP BY THE SCWA OR YOUR LOCAL WATER SUPPLIER.

JUNE: 30-SECOND

DID YOU KNOW THAT WASHING YOUR CAR FOR 20 MINUTES WITH A 5/8" DIAMETER GARDEN HOSE (NOZZLE OFF, HOSE RUNNING THE WHOLE TIME) USES 97 GALLONS OF WATER? INSTEAD, HERE'S A TIP. HOSE THE CAR DOWN, THEN SHUT OFF THE HOSE UNTIL YOU'RE READY TO RINSE. DO THE WASHING WITH A PAIL OF SOAPY WATER AND ENJOY YOUR SAVINGS. FOR A LIST OF WATER SAVING TIPS, CALL OR DROP BY THE SCWA OR YOUR LOCAL WATER SUPPLIER.

JULY: 30-SECOND

HAVE YOU MADE A HOME LEAK CHECK LATELY? YOU COULD BE WASTING . . . AND PAYING FOR . . . WATER WITHOUT EVEN KNOWING IT? IF THERE'S WATER RUNNING IN YOUR HOME, THE FLOW IS REGISTERING ON YOUR WATER METER. TO CHECK FOR LEAKY PLUMBING, TURN OFF ALL FAUCETS, SPRINKLERS, AND FIXTURES, THEN WATCH THE DIALS ON YOUR METER. IF THERE IS ANY MOVEMENT, THAT MEANS WATER IS RUNNING BECAUSE OF A LEAK. A LEAKING FAUCET CAN WASTE HUNDREDS OF GALLONS OF WATER. ALL YOU MAY NEED IS A NEW WASHER. THE SONOMA COUNTY WATER AGENCY IN COOPERATION WITH YOUR LOCAL WATER SUPPLIER URGES YOU TO STOP THE LEAKS! SAVE WATER . . . SAVE ENERGY . . . SAVE MONEY!

AUGUST: 10-SECOND

PLEASE USE WATER WISELY, EVERY LIVING THING DEPENDS ON IT. LOW SUMMER STREAM FLOWS PUT HEAVY STRESS ON FISH AND OTHER STREAM WILDLIFE. THEIR SURVIVAL IN DRY SUMMERS MAY WELL DEPEND ON HOW CAREFULLY WE MANAGE THE GARDEN HOSE. FOR MORE INFORMATION ON WATER CONSERVATION, CALL OR DROP BY THE SCWA OR YOUR LOCAL WATER SUPPLIER.

SEPTEMBER: 30-SECOND

ATTENTION STUDENTS! WANT TO BE NOTICED? ASK YOUR TEACHERS WHO CAPTAIN HYDRO IS AND IF YOU CAN HAVE SOME WATER FUN. LEARN WHY KIDS AND PARENTS, WILDLIFE AND PLANT LIFE DEPEND ON WATER AND WATER CONSERVATION! AND TEACHERS - CALL OR DROP BY THE SCWA OR YOUR LOCAL WATER SUPPLIER FOR MORE INFORMATION.

OCTOBER: 10-SECOND

IF YOU LEFT THE FAUCET ON THIS MORNING FOR THE THREE MINUTES IT TOOK YOU TO BRUSH YOUR TEETH, YOU MAY HAVE WASTED AS MUCH AS 15 GALLONS OF WATER. FOR A COMPLETE LIST OF WATER-SAVING TIPS, CALL OR DROP BY THE SCWA OR YOUR LOCAL WATER SUPPLIER.

NOVEMBER: 10-SECOND

DID YOU KNOW THAT THE BATHROOM IS LIKE AN INDOOR "NIAGRA FALLS", THAT 75% OF THE INDOOR WATER WE USE EVERY DAY FLOWS THROUGH THE BATHROOM? APPLY THE WATER SAVINGS KIT TO YOUR BATHROOM TODAY, AND SAVE WATER, ENERGY AND MONEY. KITS ARE AVAILABLE AT THE SCWA OR YOUR LOCAL WATER SUPPLIER.

DECEMBER: 30-SECOND

JUST A DROP IN THE BUCKET **.
NOTHING TO WORRY ABOUT, IT'S JUST A SMALL LEAK **.
IN THE KITCHEN, AND IN THE BATH, IN THE SHOWER AND THE GARDEN, SMALL LEAKS ADDING UP TO BIG LOSSES**.
EVEN THE SLOWEST DRIP ** WASTES 20 GALLONS A DAY, 600 GALLONS A MONTH ** 7,000 GALLONS A YEAR. THE SCWA, IN COOPERATION WITH YOUR LOCAL WATER SUPPLIER URGES YOU TO FIX THAT FAUCET. SAVE WATER . . . SAVE ENERGY . . . SAVE MONEY!

** WATER DROP SOUND EFFECT

APPENDIX 5

TV/RADIO PILOT CONSERVATION SURVEY

Postcard Survey*

Percentage Comparisons Question:	Yes Pre/Post %	No Pre/Post %	N/R Pre/Post %
1. In the last month I have heard about water conservation on the radio.	20 / 32 [60]	70 / 61	10 / 07
2. I have seen newspaper advertisements this summer about how to save water.	38 / 40 [05]	54 / 53	08 / 07
3. In the last month I have seen water conservation announcements on television.	23 / 44 [91]	68 / 50	09 / 06
4. I recently have seen billboards about saving water.	14 / 19 [36]	76 / 73	10 / 08
5. Customers should be encouraged to save water.	87 / 90 [03]	08 / 04	05 / 06
6. I am taking steps to save water because of what I have read or heard.	70 / 79 [13]	23 / 15	07 / 06

*Each of the two surveys was conducted of a random sample of 2,000 customers in Contra Costa Water District's Treated Water Division, which serves Concord, Pleasant Hill, Clayton, Pacheco, and a portion of Walnut Creek. Usable pre-media campaign returns: 310 (15.5%). Return on post-campaign survey: 506 (25%).